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THE

BRITISH MUSEUM.

THE

BRITISH MUSEUM

HISTORICAL AND DESCRIPTIVE

WITH NUMEROUS WOOD-ENGRAVINGS

EDINBURGH
WILLIAM AND ROBERT CHAMBERS
1850

EDINBURGH :
PRINTED BY W. AND R. CHAMBERS.

PREFACE.

THE present volume is intended to serve a double purpose—that of a guide-book for the use of visitors to the British Museum, more full and popular than any yet existing; and that of a descriptive account of this national collection, sufficiently interesting in itself to be read with pleasure by persons at a distance. It appeared that both these purposes would be best attained by introducing, in connection with each department, as much of general information as possible. What renders visits to such collections often tedious and bewildering is, that the visitor goes unprovided with the necessary amount of preliminary knowledge; and what renders most guide-books unsatisfactory is, that they do not attempt to supply it.

Almost all the illustrations have been engraved from drawings taken on the spot.

Where so great a variety of topics has been gone over by one hand, error can hardly have been altogether avoided. But though mistakes of detail may be occasionally detected by the technical reader, it is hoped that none will be discovered materially affecting the special utility of the volume.

A few slight changes in the arrangements of the Museum, effected since the work was written, are indicated in an Appendix; and whatever farther changes may occur shall be carefully noted in future editions. The necessity of such alterations, however, is much to be regretted, seeing that permanency of arrangement is a most desirable feature in all such exhibitions of miscellaneous objects.

LONDON, *October* 1850.

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THE BRITISH MUSEUM.

INTRODUCTION.

COLLECTIONS of miscellaneous objects and relics capable of illustrating the distant or the past are usually called *Museums*, a word borrowed from the Greek, and literally signifying a place sacred to the Muses—the patron deities among the ancients of the various arts and sciences. In the city of Alexandria there was an establishment called 'The Museum,' that had been founded by Ptolemy Philadelphus, the second of the Greek kings of Egypt, about the year B.C. 280. In this establishment, which formed part of the immense palace of the Greek monarchs, and occupied a large space of ground, there was lodged and maintained at the public expense an entire colony of learned men, natives of the various civilised countries of the world, who, freed from all care about their subsistence, were at liberty to devote themselves exclusively, with all the means and appliances that the royal wealth could purchase, to the prosecution of those branches of study in which they were respectively famous. In modern times, it is not the practice thus to collect and pension men of science; they exist in a state of distribution through general society; and the name *Museum* now implies nothing more than a place set apart as a repository for objects relating to the various arts and sciences. Such repositories are for the most part in large towns, where those to whom they would be useful chiefly congregate.

In ancient times, if there were no great national museums in the sense in which we now use the word, there were at least less pretending collections of a similar nature. Not to mention, among the Greeks, the numerous libraries, public and private, we know that their scientific men made it a practice to accumulate curious and rare objects. Thus Alexander the Great, during his wars in the East, was at some trouble to collect such zoological specimens as he thought would be interesting to his old teacher Aristotle. In the temples and oracles of the Greeks too were preserved numerous articles of a rare and costly description—the gifts of the pious, such as cups, shields, pictures, &c.—which it was customary to exhibit to visitors. The Romans, having a larger space of the globe, and a more extensive past to choose from, made even more considerable collections of foreign articles and antiquities than the Greeks. In the age of Augustus Cæsar there were numerous private collections, in which, mingled with pieces of Egyptian and Greek sculpture torn from their original sites, there were exhibited specimens of armour and other articles, the spoils of war, that had been brought from Gaul, Spain, Africa, Syria, or Britain.

In modern times, the earliest collections entitled to the name of museums were made in Italy, where, indeed, the fitting objects already existed in greatest abundance. As, since that period, science and scientific tastes have spread, museums have been established in most European cities of importance, much richer than those of which the ancient world could boast; and even in comparatively modern America there now exist collections of great extent and value.

It was not till the middle of last century that anything that could be dignified with the name of a national museum existed in Great Britain. There were, indeed, prior to that period, various private collections that had been accumulated by lovers of the arts, and by scientific men, chiefly members of the medical profession; but these were partial in their nature, and represented only the individual tastes of their collectors. Yet the great British Museum of the present day, which, for extent and importance, rivals any that exists in Europe, had its origin in the will of one of these private collectors—a London physician of eminence, named Sir Hans Sloane, who died at Chelsea in the year 1753.

During a long and busy life, Sir Hans had collected a large library of books and manuscripts, together with an immense number of miscellaneous antiquities, works of art, and objects of natural history. Anxious that his collection should form the nucleus of a national museum, the aged physician directed by his will that it should be offered for sale to the British parliament after his death for the sum of £20,000, which was £30,000 less than it had cost himself. Should parliament refuse to make the purchase, it was further directed that the collection should be offered for the same sum to certain foreign societies that were named in the will; and if these societies should not embrace the offer, then it was to be sold by public auction.

The British parliament of the day was wise enough to accept the offer made to it; and by an act passed in the session 1753–54 (26th George II.), it was directed that the collection of Sir Hans Sloane should be purchased, including 'all his library of books, drawings, manuscripts, prints, medals, and coins, ancient and modern, seals, cameos, and intaglios, precious stones, agates, jaspers, vessels of agate and jasper, crystals, mathematical instruments, drawings and pictures, and all other things in said collection or museum.' But parliament did not stop here. Availing themselves of the opportunity for founding a great national museum, they directed by the same act that the *Cottonian Library*—a collection of valuable historical manuscripts, which had been made by Sir Robert Cotton of Connington during the reigns of Elizabeth and James I., and which had been acquired by government in the reign of Queen Anne—should be added to the Sloane collection, together with a library of about 2000 printed volumes, called *Major Arthur Edwards's Library*, that had existed as a species of appendage to the Cottonian collection since 1738, in which year it had been bequeathed to the trustees by its proprietor. Thus, without any expense, a considerable addition was made to the book department of the Sloane collection. But this department was ordered to be still further increased by the purchase, for £10,000, of the 'Harleian Library of manuscripts'—a splendid collection of about 7600 volumes of rolls, charters, and other historical documents, which had been accumulated by Robert Harley, Earl of Oxford, and his son and successor Edward, and which, after the death of the latter, had come into the possession of his widow, and of his only daughter and heiress, the Duchess of Portland.

To defray the expense of these various purchases, to provide a proper repository for the museum, and to establish a permanent fund for its support, it was directed by the same act of parliament that the sum of £100,000 should be raised by way of lottery, to be invested in a body of noble and distinguished persons, who were to act as trustees, and manage the whole undertaking. After deducting expenses, however, the net sum realised by the lottery was only £95,194, 8s. 2d. Out of this sum £20,000 were paid to the executors of Sir Hans Sloane, and £10,000 for the Harleian Collection of manuscripts. There remained, therefore, £65,195, 8s. 2d. to be expended in the purchase of a house, and the establishment of the museum on a permanent footing.

Two large buildings in London were offered to the trustees as suitable for their purpose—Buckingham House for £30,000, and Montague House for £10,250. A site was also offered them in Old Palace Yard should they resolve to build a new repository. All things considered, the offer of Montague House appeared the most advantageous, and accordingly, in the spring of 1754, this building was purchased, for the sum mentioned, from its proprietor Lord Halifax.

Montague House was originally built in 1674 by Ralph Montague, Esq., afterwards Baron Montague of Boughton, and Duke of Montague. Designed by the celebrated mathematician Hooke, constructed after the manner of a French palace, and painted and decorated by foreign artists of high name and skill, it was thought the finest private residence of its time in London. On the 19th of January 1686, however, it was all but totally destroyed by an accidental fire, and a vast sum of money had to be expended in restoring it. The second building, which was raised on the old foundations, and on exactly the same plan as the first, was nowise inferior to it in beauty—French taste having been again employed in the interior decorations. It was this building that was purchased by the trustees of the museum; and after it had been thoroughly repaired, the various collections were removed into it from the separate depositories in which they had been hitherto kept for greater safety. Upwards of two years were then spent in arranging the entire collection; and it was not till the 15th of January 1759 that the museum was thrown open to the public.

Deducting the purchase-money of Montague House, together with the enormous sum of £12,873 expended in repairs, an additional sum of £4660, which had gone to purchase the necessary furniture, and some other miscellaneous items of expense, there remained a sum of £30,000 to be set aside for the permanent support of the establishment by the payment of salaries, taxes, &c.

At first, the contents of the museum were arranged under three departments—*Printed Books*, *Manuscripts*, and *Objects of Natural History*. Under the last head were included all the antiquities, works of art, &c. comprised in the Sloane collection, their number being too scanty to entitle them to constitute a separate department. In the course of a century, however, an immense increase has taken place in this portion of the establishment; and in the department of antiquities, and curiosities of art and manufacture, the museum is now very rich. A corresponding increase has taken place in the departments of Printed Books, Manuscripts, and Natural History. This general enlargement of the museum beyond the limits of the Sloane collection, which formed its nucleus, has been the result partly of continual purchases of suitable objects made out of the funds of the museum itself, and partly also of numerous gratuitous contributions made to it from time to time by private individuals in the way either of donation or bequest.

In the department of Printed Books the additions have been very extensive; and the two libraries of Sir Hans Sloane and Major Edwards, which at first constituted the whole wealth of the museum in this department, are now but an atom in the mass. In 1757 King George II. made a gift to the museum of the Library of the Kings of England—a collection embracing an immense number of printed volumes from the reign of Henry VII. downwards. To this gift was annexed the important privilege which the Royal Library had acquired in the reign of Queen Anne, of being supplied with a copy of every new publication entered at Stationers' Hall. It was thus only necessary to seek for contributions in the earlier literature of the country, and in that of foreign nations. And such contributions were rapidly made. In 1763 George III. made a present to the museum of a voluminous collection of pamphlets, &c. relating to the civil wars of England between 1640 and 1660; and among subsequent additions may be enumerated the musical libraries of Sir John Hawkens and Dr Charles Burney; a collection of old English plays by David Garrick; Dr Bentley's collection of the classics annotated by his own hand; the Law Library of Francis Hargrave, Esq.; a collection of works on natural history, made by Sir Joseph Banks; and a large mass of tracts and pamphlets relating to the French Revolution, purchased by the trustees at different times, and of very great value. Another large addition was made in 1823 when George IV. presented to the public a splendid library that had been collected by his father during his long reign at an expense of little less than £200,000. It was ordered that this library, which contains many rare books, should be attached to the museum, but kept apart from the other collections, under the name of 'the King's Library.'

To the original collection of manuscripts, comprising the Sloanian, the Cottonian, and the Harleian manuscripts, the additions have also been various. In 1757, when the Royal Library was transferred to the trustees by George II., the valuable and ancient manuscripts included in that collection, which had been begun in the reign of Richard II., went to swell this interesting department of the museum. In process of time were added other important collections; among which may be mentioned the 'Lansdowne manuscripts'—a collection of historical and state papers made by the first Marquis of Lansdowne, and purchased from his heirs for £4925; the 'Hargrave manuscripts,' consisting chiefly of law-papers; a collection of manuscripts of the Greek and Latin classics, formed by Dr Burney, and purchased in 1818; two large collections of 'Oriental manuscripts;' and the 'Howard Arundel manuscripts'—a collection of papers chiefly historical, acquired from the Royal Society in 1831. Of smaller contributions made from time to time by private persons it is unnecessary to give a list.

Considering the advances which have been made in all the branches of natural history since the foundation of the museum, it will readily be understood that the Sloane collection in this department, though good for the time at which it was formed, would now be of very little scientific value. Accordingly, much care has been bestowed from time to time in revising and extending this department of the museum. What was valuable in Sir Hans Sloane's collection has been kept, and incorporated, according to the better systems of arrangement suggested by the science of the day, with more recent acquisitions. The various voyages and exploring expeditions undertaken at the expense of government have of course contributed to enrich the museum in this department; much, however, has also been owing to the munificence of private individuals, who have sought to benefit science by adding their own cabinets to the national collection. In some cases also the trustees of the museum have induced parliament to vote considerable sums for the purchase of extensive collections that chanced to be for sale. For one cabinet of minerals, which had been formed by Colonel Greville, no less than £13,727 was given; and of the splendid fossils which form so conspicuous a feature of the museum, the greater number have been acquired in the same manner.

A collection of 336 volumes of dried plants formed part of the Sloane bequest. These, with the numerous additions made to them, continued to be included in the general natural history department, to which they properly belonged, till the year 1820, when, on the death of Sir Joseph Banks, the extensive herbarium of that distinguished naturalist became annexed to the museum. By the will of Sir Joseph, his library and herbarium were to remain in the possession of his librarian, Robert Brown, Esq., during that gentleman's life, after which the museum was to inherit them. An arrangement, however, having been come to with Mr Brown, the trustees of the museum were able immediately to take possession of this valuable bequest; and the herbarium and library were removed to Montague House, where the former, having been incorporated with all the botanical collections that the museum already contained, was constituted into a distinct department of the establishment, called the 'Botanical, or Banksian Department,' of which Mr Brown was appointed the head. This department, consisting of cabinets and portfolios of dried plants, seeds, dried fruits, fruits and flowers preserved in spirits, &c. is second in extent as a botanical collection only to that of the 'Jardin du Roi' at Paris, to which, however, it is superior in several respects.

In the Sloane Museum, as has been already mentioned, such a scanty collection as did exist of artificial curiosities and works of art constituted a mere appendage to the department of natural history—bronzes, statues, &c. being placed along with zoological specimens; while, by a similar rough classification, medals, coins, and drawings, were annexed to the manuscript department, and engravings to that of printed books. The immense increase of the museum in objects of these various description has, however, compelled a new classification; and the collection of statues, sculptures, bronzes, medals, coins, drawings, engravings, and miscellaneous curiosities contained in the museum, is now usually distinguished by the general name of the 'Department of Antiquities.' The contributions made to this department of the museum since the time of Sir Hans Sloane have quite altered the character of the institution, giving to a large section of it the appearance of an Art-Gallery. The first addition of importance was in 1772, when an extensive collection of Greek and Roman antiquities, which had been purchased by Sir William Hamilton for £8400, and which included a splendid range of ancient vases, was acquired by the museum. The next great addition was in 1802, when there arrived in this country a vast collection of Egyptian sculptures and monuments, acquired by our army on the capitulation of Alexandria by the French in the previous year. These monuments, which had been collected by the orders of Napoleon, and were on the point of being shipped for France, when they were surrendered to the British, formed a spoil such as the fortune of war rarely bestows. Their acquisition suggested the purchase in 1805 of the Townley marbles—a fine collection of Greek and Roman sculptures in the possession of the Townley family. For these marbles a sum of £20,000 was paid; and for the remainder of their collection, comprehending many vases, bronzes, coins, &c. the same family received, nine years later, a further sum of £8200. In 1815 the Phigalian marbles—a collection of sculptures dug up at Phigalia in Arcadia—were purchased for the museum by the Prince Regent at an expense of £20,000; and in the following year parliament voted £35,000 for the purchase of the Elgin marbles—a magnificent collection of sculptures, chiefly from

Athens and its neighbourhood, where they had been procured by the Earl of Elgin during his embassy to Turkey between 1801 and 1812. Later additions to the Department of Antiquities have been a series of bronzes collected by Mr Payne Knight, one of the trustees of the museum, and presented by him to the public in 1824; the Xanthian marbles, brought very recently from Asia Minor; the Assyrian sculptures, obtained still more recently from Nineveh; and numerous smaller gifts, purchases, and bequests of coins, vases, engravings, and miscellaneous curiosities.

Had the additions to the Department of Antiquities consisted merely of vases, coins, trinkets, ancient utensils, and such-like curiosities of small bulk, Montague House might have continued for a long time sufficiently large for the purposes of the museum; but as the number of statues, sculptures, and other such bulky articles increased, the original building could not contain them all. The arrival of the Egyptian monuments in 1802, many of which were so massive, that it would have been unsafe, if not impossible, to place them on the floors of an ordinary dwelling-house, suggested the necessity of a new building. These monuments, however, together with the Townley marbles, were at length accommodated in a gallery erected for the purpose, as an addition to Montague House, and which was thrown open to the public in 1807; and it was not till 1823, when the donation by George IV. of his father's library rendered more room necessary, that it was finally resolved to remove Montague House altogether, and build a new edifice on its site.

The new building was commenced in 1823, and in 1828 the eastern wing, in which the King's Library was to be deposited, was finished. Other parts of the edifice have been successively added. In 1845 the last remaining portion of the original Montague House disappeared; in 1846 the temporary gallery of sculptures, built in 1807, was removed to make way for the western wing; and already (1850) the new British Museum stands nearly complete as one of the architectural ornaments of London.

According to the original intention, the museum should have included a public Picture-Gallery; and in the Sloane bequest there were a few pictures which might have formed the commencement of such a collection. But in 1823, when Sir George Beaumont announced to the trustees of the museum his intention of making over to them, for the use of the public, his extensive collection of pictures, the impossibility of finding room for them suggested to some lovers of art the propriety of having in the metropolis, apart from the museum, a separate edifice for the reception of paintings alone. Hence the origin of the National Gallery, in which, along with the Angerstein collection of pictures purchased by government in 1824 for £57,000, and other collections acquired since, there are now placed the pictures given to the British Museum by Sir George Beaumont. In exchange for this concession, the trustees of the museum exercise a share in the management of the National Gallery.

By the act of parliament 26 Geo. II., and subsequent acts, the management of the museum is vested in a body of forty-eight trustees, of whom twenty-three are official; one is appointed by the king, nine represent the families of distinguished donors to the museum, and fifteen are elected by the other trustees. The official trustees are the Archbishop of Canterbury, the Lord Chancellor, the Speaker of the House of Commons, the Lord President of the Council, the First Lord of the Treasury, the Lord Privy Seal, the First Lord of the Admiralty, the Lord Steward, the Lord Chamberlain, the three principal Secretaries of State, the Chancellor of the Exchequer, the Bishop of London, the Lord Chief Justice of the King's Bench, the Lord Chief Justice of the Common Pleas, the Master of the Rolls, the Attorney-General, the Solicitor-General, and the Presidents of the Royal Society, the Royal Academy, and the Society of Antiquaries, for the time being. The present royal trustee is the Duke of Northumberland. The nine family trustees represent the families of Sloane, Cotton, Harley, Townley, Elgin, and Knight; the Sloane, Cotton, and Harley families appointing two trustees each. The additional trustees are usually men either of rank or literary distinction.

According to a parliamentary return, dated March 19, 1847, there were then 159 persons employed in or about the museum —namely, a principal librarian, or chief officer of the whole establishment, with a salary of £800 a year; a secretary, with a salary of £700; an accountant, with a smaller salary; seven keepers of departments, with salaries as follows:—The keeper of the manuscripts, £600; the keeper of the printed books, £600; the keeper of the minerals and fossils, £600; the keeper of the zoological specimens, £450; the keeper of the botanical specimens, £350; the keeper of the antiquities, £600; and the keeper of the prints and drawings, £350; assistant keepers in the various departments with salaries ranging from £400 to £130; supernumerary assistants with salaries ranging from about £2 to less than £1 a week. The officers in the Book Department are the most numerous in proportion. The majority of the supernumerary assistants, and many of the attendants, are paid, not by a regular yearly salary, but at a certain rate per day for each day actually employed. The total sum spent in salaries to the officers of the museum amounts to about £21,000 a year. The patronage of the various offices is vested in three principal trustees for the time being—namely, the Archbishop of Canterbury, the Lord Chamberlain, and the Speaker of the House of Commons; but in the case of the principal librarian, the election is made by the crown out of a list of two candidates named by those trustees.

From what has been said, it will be understood that the British Museum is a national institution. It has been established, and is supported, by grants of public money—its annual cost, according to the votes of parliament, being upwards of £40,000. On this account it is open in all its departments to the public without charge, but under regulations suitable to the wellbeing of so vast an establishment.

GENERAL DESCRIPTION.

On passing the gate of the museum in Great Russell Street, the visitor enters a large open court, and sees before him the southern or principal front of the museum—a handsome façade, 370 feet wide, and 66 feet high, consisting of a portico and two projecting wings, faced by a colonnade. This façade and the other three sides of the building, which are not seen from the courtyard, constitute a quadrangle of great extent. The exterior architecture of the whole is of the Ionic order; and the general effect, which is already very pleasing, will be enhanced when the sculptural decorations of the portico are complete.

Having ascended the wide steps of the portico, one passes through a great door of carved oak into a noble and lofty entrance hall, finely paved with Portland stone and gray marble, and having a beautifully-ornamented ceiling. Here the visitor usually lingers a little while to observe the effect more carefully, as well as to examine three marble statues that are in it:—a statue of the Honourable Mrs Damer—a lady of some celebrity as a sculptor, who died in 1763; a statue by Chantrey of the distinguished naturalist Sir Joseph Banks; and an ideal representation of Shakspeare, in a thoughtful attitude, by Roubillac, a French sculptor of note, resident in England about the middle of last century. This last was bequeathed to the museum by Garrick, who had purchased it. It is familiar to the public through the engravings that have been made from it, and although the conception is somewhat poor for the subject, the appearance of the statue is extremely elegant and graceful.

Quitting the entrance-hall, the visitor should ascend the great staircase on the left, with the beauty of which, and especially with the rich effect of the polished red granite which lines the walls, he cannot fail to be struck. This staircase ascended, the visitor is suddenly made aware, by the sight of two immense Giraffes immediately in front of him, with other stuffed animals all round, that he has fairly crossed the threshold of the museum. Left to himself, he would wander from this room (the central saloon) into the others as chance might direct; for neither are the rooms so arranged as to compel the visitor to follow a certain route, nor do the authorised catalogues point out any order in which the rooms should be visited. Upon the whole, it is best that it should be so, and that visitors should be permitted to move about freely as they choose; but it will serve the purposes of this digest better, if we adopt some classification of the contents of the museum, and take the several apartments one by one in a corresponding order. Readers who may use the volume as a guide-book, would do better to conform to this arrangement; and should they have time for several visits, it might not be disadvantageous, after the first cursory examination of the whole museum, to employ the remaining visits in more minutely inspecting the respective departments.

A great part of the contents of the museum may be comprehended under three heads:—I. Miscellaneous Antiquities and Curiosities, illustrating the manners and customs of ancient and foreign peoples, constituting what may be called the Ethnographical Department. II. Objects of Natural History—namely, Minerals and Fossils, Plants and Animals—constituting the Natural History Department. And, III. Works of Art, chiefly sculptures, illustrating the genius and higher mental efforts of a few illustrious nations of past times. If to these three departments we add a *fourth*, including the Library, the Prints, the Medals, and the Portraits, we shall exhaust the contents of the museum.

This classification is by no means accurate. Although, for instance, there is an evident distinction between those mere antiquities, such as lamps, axe-heads, or articles of furniture, which only illustrate the manners and customs of the ancients, and those works of art, such as statues and paintings, which illustrate the tendencies of their minds when making a high effort through their individual men of genius, yet in point of fact it is impossible to draw the line of separation, or to say which articles in any collection of antiquities are mere curiosities, and which are works of art. Strictly considered, also, works of art possess the same ethnographical value—that is, the same power of admitting us to a view of the life of the people that produced them—as mere curiosities. Nor is it necessary to point out that, in reserving the library, the prints, the medals, and the portraits, to form a fourth, or supplementary department, we proceed on a mere reason of convenience—prints and portraits belonging strictly to the department of Art, and medals to that of Ethnography. The classification, nevertheless, will be found to possess very considerable advantages for the purpose in view.

As in the classification itself strict scientific accuracy has been sacrificed to convenience, so, in arranging the different rooms of the museum to correspond with that classification, convenience must again be the standard. In some of the rooms devoted to the reception of antiquities, the articles are so multifarious, being arranged more according to their size than their nature, as to belong one half to the Ethnographical department, and the other half to the department of Art. All things considered, however, the following arrangement will be found liable to the fewest objections:—

I. THE ETHNOGRAPHICAL DEPARTMENT, including the apartments thus named in the authorised catalogue:—1. *The Ethnographical Room;* 2. *The Egyptian Room;* 3. *The Bronze Room;* and 4. *The Etruscan Room;* all of which are on the upper floor, the Ethnographical Room in a corner by itself, close to the great staircase, and the other three contiguous, in another part of the building.

II. THE NATURAL HISTORY DEPARTMENT, also on the upper floor, and including, 1. *The Central Saloon;* 2. *The Mammalia Saloon;* 3. *The Southern Zoological Gallery;* 4. *The Eastern Zoological Gallery;* 5. *The Northern Zoological Gallery* (Five Rooms); and, 6. *The North Gallery*, devoted to Mineralogy and Geology.

III. THE DEPARTMENT OF SCULPTURES, all on the ground-floor, and including, 1. *Room I.;* 2. *The Lycian Room;* 3. *The Temporary Passage;* 4. *The Grand Central Saloon;* 5. *The Phigalian Saloon;* 6. *The Elgin Saloon*; and, 7. *The Egyptian Saloon.*

IV. THE LIBRARY, together with the *Print-Room*, the *Medal-Room*, and the collection of portraits hung in the Eastern Zoological Gallery.

ETHNOGRAPHICAL DEPARTMENT.

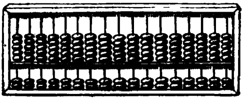
I.—ETHNOGRAPHICAL ROOM.

Turning aside from the *Central Saloon*, which is the first entered from the great staircase, the visitor will find the *Ethnographical Room*, an oblong apartment of considerable size, though much too small for its purpose, which is the collection of articles illustrative of the manners and customs of nations lying at a distance from our own, as well as of rude ancient races. A few of the bulkier articles are placed on the floor in the middle of the apartment, but the greater proportion are ranged in glass-covered cases or presses round the walls; each nation being assigned one or more cases, according to its importance, or rather according to the number of articles relating to it.

How meagre, upon the whole, this portion of the museum is, may be judged of from the fact, that to the great nations of China and Japan, so interesting to us as presenting a civilisation in some respects as advanced as our own, although of a singularly distinct kind, all that can be assigned are five paltry cases, containing a few figures of gods, musical instruments, &c. Supposing the miscellaneous articles—flutes, watches, snuff-boxes, &c.—that lie exposed in a single window of any London pawnbroker's shop to be carried to any of the inland cities of China, and there exhibited in a museum, the assistance they would give to a Chinese in forming an idea of British life would be about as great as that which the British Museum affords to Londoners for the study of life in China. But in a national repository one looks for something like completeness; nor would it be difficult to have in the museum separate rooms for the greater nations, such as the Chinese and the Indians, regarding whom our conceptions may already be tolerably complete, leaving the Ethnographical room for the mere temporary reception of miscellaneous curiosities pertaining to those minor races of whose customs we are comparatively ignorant.

At the same time, one advantage arises from the assemblage of so many heterogeneous articles in the same room—that of being able to compare the general tastes and apparent character of the several nations whose productions are thus brought into juxtaposition. Commencing at the door, and following his right hand, the visitor of the Ethnographical room, inspecting the cases in their order, is obliged to pass from China (Cases I-V) to India (Cases VI-IX), and on in succession to Africa (Cases X-XII); the different regions of native North America (Cases XIV-XXX), the different regions of South America (Cases XXXI-XXXVII), thence by a sudden leap backward in time to Ancient Britain and Gaul (Cases XXXVII-L), and again forward to the South Sea Islands and the vast regions of Australasia (Cases L-LXXIV). At first the eye is simply confused by this succession of spear-heads, rings, feathers, and cloths, brought from all parts of the earth's surface, and from different points, so to speak, in the darkness of the past; but, by looking long and attentively, one begins to discern differences in the different compartments, and to see what it is that is specially Chinese in the Chinese compartment, what specially Indian in the Indian, and wherein the African compartment differs from either.

A mere glance at the articles in the Chinese cases (Cases I-V) would convince a person of observation that they come from a highly-civilised country. Not to mention spears, bows, and arrows, and such-like articles, which even comparative savages possess, we have here a pair of native spectacles in a shagreen leathern case, a shoe-horn with shoe-brushes attached to it; a *viatorium*, or traveller's guide, consisting of a mariner's compass and *portable* sundial for the pocket; a Chinese bank-note; a *swan-pan*, or abacus, an ingenious instrument (also known to the Romans) for assisting in computation; and many other contrivances which none but a highly-cultivated people could require or think of. Yet with such evidences of Chinese ingenuity and skill before us, there are probably few persons in Europe who have formed a just estimate of the Chinese, so difficult is it to infer the condition and character of a people from mere hand-specimens of their manufactures brought over the seas, and huddled together on a few shelves. That they are a population of corpulent and clever barbarians, who wear pig-tails, make tea and porcelain, bandage the feet of their women, and carve neatly, and with effect (see next page), in ivory, is the common conception of them; and this, notwithstanding the numerous books that have been written to give us truer ideas of themselves and their country. The Chinese, these books tell us, are a vast nation of some 300,000,000 of souls (nearly a third part of the whole human race,) inhabiting a country the area of which is about 1,200,000 square miles, or one-third that of Europe. For a country of this area to accommodate


Chinese Abacus.

so vast a population, it must necessarily be more densely-peopled than either England or Holland, whose populousness is usually regarded as indicating their high civilisation. In no country, moreover, are there so many large cities as in China, and in no country is the land so assiduously cultivated: there is scarcely any meadow ground for cattle; every available acre of ground is used for the produce of human food. Cheerful, industrious, and orderly in their habits, the entire Chinese population is subject to the supreme and despotic authority of a single hereditary ruler who resides at Pekin, the chief city of the whole empire. Under him the government is administered by a descending hierarchy of officials or mandarins, who are chosen from all ranks of the people, according to their talents as displayed in the course, first of their education at school and college, and afterwards of their public life. The officials are, in short, the men in highest repute for scholarship and accomplishments in the empire; and the whole system of the government is that of promotion upwards from the ranks of the people, according to merit. The highest officials are the governors of the eighteen provinces into which the empire is divided. These provinces, each of which is, in fact, an important state, differ from each other in extent, in climate, in produce, in dialect, and, to a certain degree, in manners and customs; but over the whole empire a common physiognomy and civilisation prevail, and one written language is used. The Chinese generally are remarkable for common-sense, orderliness, and frugal prudential habits, with a want of enthusiasm or high sensibility to what is elevated or poetic. Printing and paper being cheap among them, and education universal, they have an immense literature, chiefly in the departments of the drama, the novel, and the moral essay; their best writers of fiction are said to resemble Richardson in style, and their best moralists Franklin. The greatest name in their literature, or indeed in their history, is that of Confucius, a philosopher and religious teacher who lived about 500 years B.C., and who left a number of books expounding and enforcing the great maxims of morality. During all the revolutions that have since elapsed, the doctrines of Confucius have retained their hold of the Chinese mind, and the religion of China consists in little more than an attachment to these doctrines, and a veneration for their founder. With abstract notions of the Deity, and of the destiny of man when he quits this life, the Chinese do not

Chinese figure in ivory.

trouble themselves; a moral, correct life, and especially an honourable discharge of the duties of a son and a citizen, is the whole aim of their piety. There are, however, some voluntary sects among them, who superinduce articles of speculative belief on the prosaic code of morality established by Confucius; and forms of religious worship are practised over the whole country under the direct sanction of the government. Among the curiosities in the cases under notice are a number of figures, larger and smaller, of Chinese divinities, some of which are very neatly carved in ivory, wood, and stone. With what precise feelings the more educated Chinese address these images in prayer—whether they look upon them as symbols, or whether, like Polytheists generally, they actually view the carved figures themselves as gifted with powers—it would be difficult to say; the mass of the people, however, probably never ask the question, but, from the mere force of custom, come to regard such objects as the figure of Kwan-yin, the goddess of mercy, which is visible in Case III, and the two larger gilt figures of the god and goddess beneath in the same case, precisely as the Polytheistic Greeks or Romans regarded their statues in their temples; that is, as real divinities with power for good or evil. The religious sentiment, however, sits very lightly on the Chinese. A friend of ours saw one of the sailors of the Chinese junk light his pipe at the sacred fire burning before the figure of the god stationed in the ship; and this seemed usual. Absence of any feeling of the supernatural is perhaps the most remarkable feature of the Chinese character. They take an interest in what is curious, useful, or ornamental; but to what is profound or remote from common apprehension they are indifferent. Hence, though they have a considerable stock of empirical knowledge, and excel in all kinds of ingenious fabrications and devices, they have no high science, no mathematics, no chemistry, no astronomy. In music also, though they have some taste, they have not made great proficiency; they have little or no idea of harmony. Their musical instruments, of which there is a collection in Cases IV and V, are usually tuned in unison.

Kwan-yin.

Altogether, the Chinese are a most remarkable people, and when standing opposite those few cases of curiosities in the British Museum, the visitor ought to try to realise the fact, that they typify a vast civilised aggregate of the human race, existing at the other side of the earth, almost exactly in the condition in which it existed 2000 years ago, and in our farther intercourse with which many curious things may yet come to pass. The Duke of Wellington seemed to have formed a more just conception of the Chinese than was to be expected from a man of his unimaginative habits, when, not long ago, he spoke of the difficulty of getting the Chinese government to attend to outrages committed against the Queen's subjects; a mode of speaking which, though it seemed quaint, from the familiar relationship in which it placed ourselves and so distant a people, was quite accurate. There *is* on the earth a great civilised power called the Chinese government, with which, though at the present it shuts itself up, regarding Europe as a distant assemblage of semi-barbarous states, we shall sooner or later establish intimate relations. The overtures, however, must come from our side; Europe must lay open China, for China will not come to meet Europe. When there shall be railroads in China, with Chinese and European engineers, how different will be the aspect of that portion of Asia!*

The articles contained in the next four cases (Cases VI-IX) are, on a superficial view, so like those in the cases devoted to China, that the visitor is not at first aware that in turning to them he has passed to India: and yet there is no greater possible contrast than between the Chinese and the Indians—the former, as we have just said, prosaic, matter-of-fact, and utilitarian in their mode of thinking; the latter imaginative, superstitious, and fond of abstract speculation. In numbers, the Indians—including under that designation the Hindoos proper, or inhabitants of Hindostan, and the Burmese, or inhabitants of the eastern peninsula—are supposed to amount to about 120,000,000, speaking a variety of languages. At the earliest period to which history reaches back, the vast territory which these millions cover was divided into numerous states or kingdoms, each governed despotically by a hereditary sovereign or absolute lord of the soil, called a Rajah, who appointed inferior officers, responsible to himself, to administer the separate portions of his dominions. The greater part of the population in each Hindoo state lived in villages, supporting themselves by the cultivation of the adjacent lands, an exorbitant proportion of whose produce, however, was exacted from them by the government, that is, by the rajah and his subordinates, in the name of rent. This village-system was general over all India, but in every state there were also several cities of considerable size. But the most remarkable feature in the civilisation of the ancient Indians was the division of the population into castes or orders. One small proportion of the population in each state, dignified by the name of *Brahmins*, was held to be of an origin superior to the rest; to them, in especial, had the Deity assigned all occupations of an intellectual or spiritual nature; their persons were sacred, and their destinies, as well in the next world as in this, were to be more exalted than those of other men. Next in importance to the Brahmins were the *Kshatriyas*, or military caste, whose duties were those of war and secular government. The rajahs and other rulers were usually of this caste, but their chief advisers were Brahmins. Under the Kshatriyas were the *Vaisyas*, or agricultural caste, comprehending a much larger proportion of the population than either of the two former; and under these were the *Sudras*, or servile caste, including the great mass of the population earning their livelihood by menial occupations. This last caste was regarded as a degraded portion of the community; but lower still, in the esteem of the Brahmins, were the mixed castes, of which there were many—the results of intermarriage between the four leading castes. The position of every person in society, his occupations, and the whole tenor of his life, were determined by his caste; and for a Hindoo to step out of the career thus marked out for him by the accident of his birth, was almost impossible. An aggregate of states, in each of which this system prevailed, society cohering for ages in each in the same sluggish form—such was ancient India. The first great event that had a tendency to disturb the monotony of Hindoo history was the invasion of the country by the Mohammedans from Persia about 1000 A.D. Gradually overrunning Hindostan, the Mohammedans acquired the supremacy in several of the states, and in all exerted their influence. Their power was at its height (A.D. 1650-1770) when the British entered on this great field of enterprise. Visiting the country first as mere traders, tolerated by the Mohammedan and Hindoo authorities, they gradually extended their power from the coasts inland, until they became masters of the peninsula, the whole of which they may be said now to rule either directly, as in the presidencies, or through the medium of native rajahs, whom they protect and superintend. Subtracting the British residents scattered through India, and the Mohammedans, who are far more numerous, there remain the native Hindoos—the aborigines of the soil. It is they who are represented in the articles in Cases VI-IX. The Mohammedan and the British invasions have in some respects altered their manners and customs, in particular the system of castes appears to have lost a portion of its ancient rigour; but, upon the whole, the Indians of the present day display the same characteristics that distinguished their ancestors in the time of Alexander the Great. On comparing them with barbarous races, it is impossible to deny them the name of a civilised people, seeing that they exhibit a high degree of mental culture, possess a rich and abundant literature, and show considerable skill in many of the arts; and yet, though we call them our fellow-subjects, we give them no closer place in our sympathies than if they were savages. This arises from the fact, that their differences from ourselves are so striking. In the first place, their appearance, both as regards complexion and costume (see the collection of native models chiefly from Northern India, on shelf 2, Cases VIII and IX), is so different from ours, that, accustomed as we are to associate civilisation with broad-cloth and buttoned dresses, we can scarcely believe it when we are informed that in average mental power Hindoos are our equals. Hindoos are usually of short stature, with tawny skin, and light and supple limbs, and on account of the climate, they are at most seasons thinly clad in cotton. They are characterised by an extreme lassitude and love of repose, accompanied by great keenness of susceptibility, and power of passive endurance. In the northern parts of India, adjoining the Himalayas, the natives are, however, hardier and stronger than in the south. In disposition the Hindoos are mild and docile, with a tendency to crimes of deceit rather than crimes of violence; but it is in *their mode of thinking*, to employ a general phrase, that the Hindoos differ so much from Europeans. Possessing, as has been said, a power of fancy, and a tendency to abstract speculation, unknown to their neighbours the Chinese, their mental efforts are chiefly in the regions of metaphysics and mythological poetry; they delight rather in contemplations regarding the Deity, the mysteries of the creation, and the future destinies of man, than in the sciences immediately connected with practice. The religion of the Hindoos is bound up with their whole system of life, and is the strangest possible medley of abstract theology, wild legend, and ceremonious worship. In theory it professes to be a Monotheism, or rather a Pantheism, maintaining the existence of a great Eternal Spirit, the soul of the world, from whom all things and beings are but emanations; but virtually it is a system of Polytheism, more gross than that of the ancient Greeks and Romans. At the head of a Pantheon of many millions of deities (of some of which see figures in cases VI, VII, shelf 2, and VIII and IX, shelf 1) are Brahma, Vishnu, and Siva, the three principal gods; the first the creator, the second the protector, and the last the destroyer of the universe. Brahma is now almost obsolete as an object of worship, and the Vishnuites and Sivaites (see figure of Siva over Cases VIII and IX) are the chief existing sects. Asceticism, and respect for animal life, are the principal features in the religious practice of both, and the most devout in all the prescribed observances are the members of the Brahminical caste. To this system of religion, which has existed in India from time immemorial, and is probably coeval with the system of castes, there once existed a rival in another system named *Buddhism*, which was founded, as is commonly believed, some centuries before Christ by a Hindoo prince and sage named Gautama. As originally propounded, Buddhism is supposed to have been a purer and more reasonable form of faith than Brahminism, recognising more clearly the spiritual and moral aims of religion; but, having been expelled from Hindostan during the early centuries of our era, after having undergone severe persecution from the Brahmins — at whose power it struck, by proscribing the system of castes—it sought refuge in the eastern peninsula, Ceylon, Thibet, China, and Japan, where it has been modified and corrupted into various forms. In Cases VI and VII, shelf 1, there are various figures of Buddha or Gautama, as he is worshipped in Birmah. Deducting the images of the various divinities contained in the cases devoted to India, and which differ from the similar figures in the Chinese cases only in being less neatly carved, and of more grotesque form, there remains but a scanty collection of other articles. The most interesting are some specimens of arms from the north-western districts (Cases VIII-IX, shelf 3); an elaborately-carved guitar; a set of native playing cards of a round shape; and some ancient copperplates, containing grants of land engraven in native characters (Cases VI-VII, shelf 3). The Hindoos are believed to be the inventors of the game of chess. 'In the mechanic arts,' says Bishop Heber, 'they are not inferior to the general run of European nations. Where they fall short of us (which is chiefly in agricultural instruments and the mechanics of common life), they are not, so far as I have understood of Italy and the south of France, surpassed in any great degree by the people of those countries.'*

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* For a popular account of China and its People, see Davis's Chinese.

Birmese Buddha.

Of a kind totally different from the articles from China and India are those in the cases (X-XIII) devoted to the great continent of Africa. Here, with the exception of a few articles, such as the quadrants in Case X, shelf 1, brought from those parts of northern Africa into which the Arabs have penetrated, there is nothing to betoken high culture or civilisation. Nor, on the other hand, are there images of deities to indicate, by their number as compared with the other objects, the existence in the country from which they come of any elaborate and established system of worship. We are here introduced, in short, to that great negro[1] or Ethiopian race which overspreads the African continent, divided, it is true, into tribes and nations of various degrees of culture, but nowhere advanced beyond that primitive stage of existence which is indicated by the prevalence of fetish-worship, and the absence of any literature. The great proportion of the articles are from the western coast of Africa (Sierra-Leone, Ashantee, &c.), and from those portions of the interior which have been visited during the exploring expeditions up the Niger. As usual, instruments of war—which are much alike in all savage countries—swords, bows, arrows, quivers, spears, form part of the collection. But the eye is pleased to see these weapons decidedly outnumbered by objects of a different kind, clearly betokening that among these native African tribes there is a spirit of industrial activity from which we may augur hopefully of their future. The cases present many interesting specimens of negro manufacture. From Ashantee, for example, side by side with so ugly an article as a royal warhorn made of a human jaw and an elephant's tusk (Cases X-XI, shelf 2), are bowls of earthenware of various shapes, two native musical instruments, and specimens of dressed leather; while in shelf 3 is a collection of wooden boxes, and calabashes carved with considerable skill. But it is in the department of weaving and cloth-making that the African cases make the best show. Here (Cases X-XI, shelf 2) we have a shuttle and reel of cotton thread, spindles, patterns of cloth of different patterns, both cotton and silk, plain and dyed with indigo, all from Ashantee; and again (Cases XII, XIII, shelves 1 and 2), 'various specimens of cloth, mostly of native fabric,' from the banks of the Niger; 'one a piece of cloth 16¼ feet long by 7¼ feet wide, decorated with borders and various stellated patterns produced by discharging the deep colour of the indigo, woven in stripes three inches wide; another similar, but of check pattern;' together with spindles, shuttles, hanks of thread white and blue, specimens of raw native silk both in the cocoon state, and dyed yellow, green, and crimson, all from

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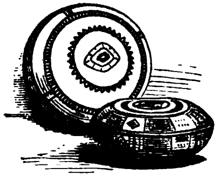
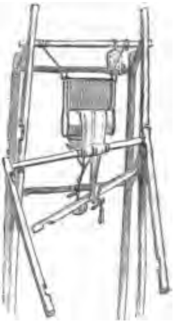
* For an instructive account of the Hindoos, see 'Hindoos,' in Library of Entertaining Knowledge.



Calabashes.

the interior; while over Case XIII is a specimen of a native loom used for the manufacture of narrow cloth. This display of thread and cloth in all its shapes, and in that variety of gaudy colours of which the negroes are so fond, has a pleasant effect, suggesting as it does the docility and cheerful industry of these tribes; and, on the whole, the African cases are on this account better worth looking at than either the Chinese or the Indian, from which similar specimens of Chinese and Indian weaving are necessarily omitted. There is much truth in the observation, that in the negro character there is by nature a greater tendency to those mild virtues, that patient and affectionate spirit, which Christianity recommends, than is visible among Europeans; and when, in connection with this, we consider the industrious disposition of the negroes, and the absence among them of any dominant form of superstition, we cannot doubt that, as the friends of their race fondly hope, some peculiar career subserving the general progress of the world yet awaits them.*


African Loom.

We pass next to the great continent of North America (Cases XIV-XXX). 'The Indians of North America,' says Mr Catlin, 'are copper-coloured, with long black hair, black eyes, tall, straight, and elastic forms, are less than 2,000,000 in number, were originally the undisputed owners of the soil, and got their title to their lands from the Great Spirit who created them on it; were once 16,000,000 in number, and sent that number of daily prayers to the Almighty for his protection. Their country was entered by white men but a few hundred years since; and 30,000,000 of these are now scuffling for the goods and luxuries of life over the bones and ashes of 14,000,000 of red men, 6,000,000 of whom have fallen victims to the small-pox, and the remainder to the sword, the bayonet, and whisky. Of the 2,000,000 remaining alive at this time, 1,400,000 are already the miserable living victims and dupes of white man's cupidity—degraded, discouraged, and lost in the bewildering maze that is produced by the use of whisky and its concomitant vices; and the remaining number are yet unaroused and unenticed from their wild haunts or their primitive abodes, by the dread or love of white man and his allurements.'

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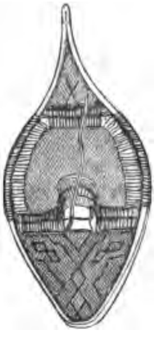
* See Murray's Africa, Park's Travels, &c. for detailed accounts of negro manners and customs.

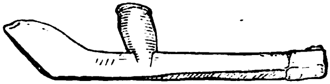
The 16,000,000 of human beings mentioned in this paragraph as the original possessors of North America when it was discovered by the whites, were spread very thinly over its vast extent. Only in the southern portion of the continent, where it narrows towards South America, was the population at all dense. Here, by the operation of causes which it is impossible for us to trace, there had sprung up a native civilisation of no mean order—that of the Aztecs or Mexicans. Founded, according to native traditions, about the twelfth or thirteenth century of our era, the Mexican kingdom had gradually enlarged itself; the Indian races in its vicinity consolidated round it as a centre; and at the time (1518) when the Spaniards landed in North America, they found the whole breadth of continent between the Gulf of Mexico and the Pacific dotted with towns and villages, and inhabited by an associated people stationary on the soil, and possessing many of the arts and habits of civilised life. To the north of this comparatively civilised country, however—that is, from the Gulf of Mexico to the Arctic regions—the continent was overspread by the American Indians proper, who for the most part led a nomadic life, wandering in tribes from place to place, each tribe within certain defined limits, and living on the produce of the chase. Of these tribes the easternmost, inhabiting the territories which now constitute the United States and Canada, were extirpated to make way for the whites; and now the only remains of the aborigines of America, besides the Esquimaux in the north, are a few tribes which, under the names of Crows, Sioux, Blackfeet, Ojibbeways, Choctaws, Cherokees, &c. are able still to maintain themselves to the west of the lands colonised by white men. The tribes nearest the frontier of the United States are a mongrel race, degraded by their contact with the whites; and it is only the remote tribes in the neighbourhood of the Rocky Mountains that retain unchanged their primitive Indian habits, and illustrate, in their present state, the condition of America while it was still wholly under the dominion of red men.

The curiosities in the cases under notice may be divided into three classes: *first*, those which illustrate the manners and customs of the present *Esquimaux*, or remote northern tribes; *secondly*, those which illustrate the manners and customs of the present *North American Indians*, properly so called—that is, of the surviving native tribes west of the countries hitherto colonised by Europeans; and *lastly*, those which, under the more distinctive name of Mexican antiquities, illustrate the manners and customs of the extinct *Aztecs*, or Mexicans, and help us to conceive the nature of that singular civilisation which was spontaneously springing up in North America, and which might have overrun the whole continent had it not been prematurely cut short by European colonisation. Of articles from the extreme northern regions of America there are a great variety (Cases XIV-XXI); articles of dress made of skin; harpoons, spears, darts, and other instruments made of bone; fishing-lines, hooks; jackets made of the intestines of the whale; models of canoes, &c. all indicating the hardy life, half fisher, half huntsman, of those inhabitants of the snowy coasts of America.

The articles illustrative of the life of the North American Indians proper are fewer in number (Case XXII). Many of the articles, however, brought from the regions of the Esquimaux are in use farther south—as, for instance, the snow-shoes (Cases XVIII, XIX, shelf 3), those large, kite-shaped frames and netting on which the native Indians skim so lightly over the deep snows, in which, without their assistance, they would sink; and the skin-dresses which everywhere mark the huntsman mode of life. 'The art of dressing skins,' says Mr Catlin, 'belongs to the Indians in all countries; and the Crow Indians near the Rocky Mountains surpass the civilised world in the beauty of their skin-dressing.' The North American Indians display considerable ingenuity in the manufacture of many other articles. Their tomahawks and scalping-knives, according to the statement of Mr Catlin, are universally of European make, even the remotest tribes being supplied with these instruments of death by traders from the west; but they themselves make their ordinary weapons, such as stone knives, hatchets, arrows, &c.; they likewise manufacture boxes of wood, and vessels of earthenware; and some tribes make beautiful ornaments of the quills of the porcupine (see Case XXII, shelf 3). Among the most interesting articles in this case are specimens of the calumets or pipes of peace, and the wampum-belts, with the uses of which all readers of Cooper's novels must be familiar. Of the Indian pipes (of which the calumet is but the most distinguished variety, smoked on solemn occasions, as when a treaty is made between the chiefs of hostile tribes), the bowl, says Mr Catlin, is always made of one particular kind of stone, of a cherry-red colour, brought from a quarry on the frontiers of the Wisconsin territory, regarding which the Indians have many superstitious notions, believing that it consists of the flesh

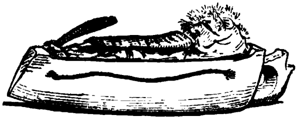


Snow-shoe.



Calumet, or Pipe of Peace.

of a huge army of red men, whom the Great Spirit turned at once into stone. This stone they scoop out very carefully, fitting the bowl into a shaft of wood (usually the young ash, which has a thin pith, and is easily bored) two or three feet long, and highly ornamented with braid, hair, birds' beaks, claws, &c. Smoking is universal among the Indians, and they use various weeds for the purpose besides tobacco. 'Wampum,' says Mr Catlin, 'is the Indian name for ornaments manufactured by the Indians of parti-coloured shells which they get on the shores of fresh-water streams, and file and cut into bits of half an inch in length, and perforate, and giving to them the shape of pieces of broken pipe-stems, string on deer-sinews, and wear on their necks, or weave ingeniously into war-belts for the waist. Wampum was used as a circulating medium instead of coin—so many strings of wampum for a horse, &c; and the wampum-belt in treaties passed as a pledge of friendship, and was sent as a symbol of peace to hostile tribes, or paid, so many fathoms' length, in tribute.' The genuine Indian wampum, Mr Catlin adds, is rarely to be met with now; a spurious imitation of it, manufactured by steam in the United States, having been introduced by traders among the tribes near the frontier, thereby depreciating the native currency. In the same case with the calumets and the wampum-belts are to be seen some genuine scalps (circular pieces of skin with the hair attached, torn as trophies from the heads of dead or living enemies, and kept as the most valuable of personal possessions), and specimens of native American cradles. One of the cradles is from the territory of the Flat-head Indians on the other side of the Rocky Mountains, and shows the manner in which the women effect that remarkable depression of the foreheads of their children from which the tribe derives its name.


Flat-head Indian Cradle.

To the Mexican antiquities are devoted eight cases (XXIII-XXX); they consist chiefly of articles excavated in the island of Sacrificios, off Vera Cruz. This island derived its name from the practice of human sacrifice which prevailed among the Mexicans, and of which the Spaniards under Cortes here saw the first but not the last nor most disgusting evidences. In every town in which they halted on their march into the interior of the country, they found temples whose walls and floor were smeared with human blood. The priests who ministered in this horrid service, and who constituted a sort of caste among the Mexicans, are described as having been 'dressed in black mantles with hoods; their hair was long, and matted with blood; their ears were torn and cut, and they smelt horribly, as it were, of sulphur and human flesh.' To offer sacrifice seemed to be their principal business. Laying the victim bound upon a great stone in front of the sanctuary of the deity, it was their practice to open the breast with a knife of flint or obsidian (see Cases XXIV, XXV, shelf 2), and take out the heart. This having been laid in a flat vessel (see Cases XXV, XXVI, shelf 1) with gum-copal, was placed before the deity; the rest of the body was torn in pieces, and sometimes (as in the case of the unfortunate Spaniards that were taken prisoners in the battles fought previous to the final conquest of the Mexicans) eaten by the worshippers. Notwithstanding these practices of human sacrifice and cannibalism, it is indubitable that the ancient Aztecs had made considerable progress in civilisation. Of this there is evidence in such articles as those visible in the same cases with the knives and vases of sacrifice—the ornaments, statues, and sculptured figures made of hard obsidian, and some of them marked with hieroglyphics; and vases and other vessels of earthenware, some of them finely executed, and also marked with hieroglyphics—of which the Mexicans had a system of their own. But fully to appreciate the degree of cultivation to which the Mexicans had attained, one must read the accounts of them that have been handed down by the Spanish 'Conquistadores,' who saw them in the day of their glory. Take, for example, the following description given by Bernal Diaz, one of the soldiers of Cortes, of the great market-place of Mexico when the Spaniards were first permitted to visit it:—'When we arrived there,' says the Spaniard, 'we were astonished at the crowds of people, and the regularity which prevailed, as well as at the vast quantities of merchandise which those who attended us were assiduous in pointing out. Each kind had its particular place of sale, which was distinguished by a sign. The articles consisted of gold, silver, jewels, feathers, mantles of cotton, chocolate, skins dressed and undressed, sandals, and other manufactures of the roots and fibres of nequen, and great numbers of male and female slaves, some of whom were fastened by the neck in collars to long poles. The meat-market was stocked with fowls, game, and dogs. Vegetables, fruits, articles of food ready dressed, salt, bread, honey, and sweet pastry made in various ways, were also sold here. Other places in the square were appropriated to the sale of earthenware, wooden household furniture, firewood, paper, sweet canes filled with tobacco, copper axes, and working tools, and wooden vessels highly painted. Numbers of women sold fish and little loaves made of a certain mud, and which resembles cheese. The makers of stone blades were busily employed shaping them out of the rough material; and the merchants who dealt in gold had the metal in grains as it came from the mines in transparent tubes, so that they could be reckoned. The entire square was enclosed by piazzas, under which great quantities of grain was stored, and where were also shops for various kinds of goods. Courts of justice, where three judges sat to settle disputes that might arise in the market, occupied a part of the square; and officers were in the market inspecting the merchandise.' Such was the market-place of Mexico, the capital city of the Aztec kingdom. The city, which was large, and well built, with streets regularly laid out, was situated on an island in the midst of a lake. It communicated with the mainland by stupendous piers or causeways, which opened to roads leading in different directions through the empire. Nor was Mexico the only large town of the Aztecs; there were several others of considerable size between Mexico and the sea; and of these, one, named Cholula, was celebrated for its pottery. In short, ere ever European had set foot in America, there existed in that continent, under the name of the Aztec, or Mexican empire, a flourishing native state, with laws, arts, and a religion; and under the influence of this state, the whole of North America might ultimately have attained some degree of civilisation even if white men had never visited it.*

Of the original, as of the present condition of South America (Cases XXXI-XXXVII), less is known than of that of the northern portion of the same continent; but, like North America, it appears to have been inhabited at the period of its discovery by an immense number of tribes or nations, differing from each other according to the difference of climate, &c. in the portions of the continent which they respectively occupied, but possessing in common certain characteristics distinctive of the red or copper-coloured race. And precisely as in North America there had sprung up the native civilisation of the Mexicans or Aztecs, so in South America there had sprung up another native civilisation—that of the Incas or Peruvians, under which it is probable the whole of South America would sooner or later have succumbed had it remained unknown to Europeans. The empire of Peru, or, as it was called by the Peruvians themselves, 'Tavantinsuyu'—that is, 'the four quarters of the world' (Peru being a mere name of Spanish invention, derived, it is said, from *pelu*, the native word for *river*)—included a strip of the western coast of South America of varying width, according as the great mountain-chain of the Andes approached or receded from the sea, but extending in length from two degrees north to thirty-seven degrees south latitude. Of this immense empire, the capital, as well as the spot whence dominion had gradually spread over the rest, was the city of Cuzco. In this neighbourhood, according to the native tradition, there had descended from heaven two supernatural beings, male and female, named Manco and Mama Capello, the children of the sun, and the destined founders of the Peruvian empire. Advancing through the country from the place where they had first appeared, they taught the people agriculture and the other arts; and becoming the king and queen of a vast multitude of adoring subjects, established among them that system of society which was to prevail in Tavantinsuyu. The chief feature of this system was a most rigorous distribution of the people into castes. At the head of all was to stand the reigning monarch, the descendant and representative of the sun, whose power was to be absolute and divine. Under him, as governors of the people, were to be the Incas—that is, the relatives of the sovereign, all of the royal line of Manco Capello; inferior to whom were to be the great mass of the people divided into classes differently costumed, and labouring each family in its hereditary vocation. Every year there was to be a new partition of all the lands of the empire; and a threefold division of the fruits of the soil—one part for religion and charity, one for the Incas and the government, and one for consumption by the producers. Such was the system prescribed by Manco and Mama Capello; and such was the system which the Spaniards, when they arrived, about three centuries after the date to which the natives assigned the appearance of these legendary personages, found actually prevailing. In no known country were the lives and industry of the community so completely at the disposal of the central power; a mild despotism regulated everything, and by means of officers, or overseers of labour, responsible to government, every man was kept busy in his own particular trade. Meanwhile, however, the kingdom founded by Manco Capello had been enlarged by his successors until it had reached the limits mentioned above. Over all that vast tract of South America the worship of the sun, which was the national religion of the Peruvians, had been spread; and with it their political system and the pure Peruvian *Quichua*—a language used for official purposes wherever the arms of the sun had been carried. Sometimes the conquered chiefs were continued in office, but in all cases the Incas ruled as a dominant caste. As in Mexico, numerous cities and villages had sprung up, in which were workshops of various descriptions, and temples and other public buildings of considerable dimensions. In agriculture the Peruvians had made great proficiency. They practised rotation of crops; used guano as manure; irrigated their lands by means of aqueducts; and were skilful breeders of the *llama*, whose wool they manufactured into cloths, shawls, carpets, &c. They could dye brilliantly, and understood the art of feather-weaving, in which the Mexicans excelled. By means of tools made of a peculiar composition of copper and tin (they had not learnt the use of iron), they cut wood and stone. But what astonished the Spaniards most was their roads, the remains of which are still to be seen, along with some remains of their architecture. The chief road was from Quito to Cuzco, and thence southward through the country now called Chili. It was 20 feet broad, and not less than 1500 miles long, laid with broad flags, often piercing hills, and in many places carried across wide ravines by means of great suspension-bridges made of cables of the *maguey*, a kind of osier. Along this road were stone pillars placed at intervals to serve as milestones, and also inns and post-houses for the use of the Incas. Lastly, as an evidence of the degree of civilisation to which the Peruvians had attained, it is stated that they had actually an annual census and survey of the empire.

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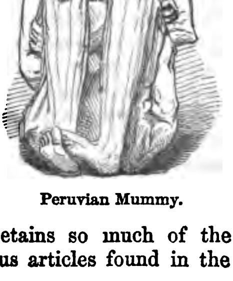
* See 'Parry's Voyages,' Catlin's 'North American Indians,' Prescott's 'Conquest of Mexico,' and 'Stephens's Travels in Central America and Yucatan.'

This singular civilisation, like that of the Mexicans, of which in its origin it appears to have been quite independent, was suddenly overthrown, however, by the arrival of the Europeans. What Cortes did for Mexico, Pizarro did for Peru; and through it the Spaniards advanced over the whole of South America, the possession of which they shared with the Portuguese. While, accordingly, North America is in the hands of the Anglo-Saxon race, South America is now inhabited almost exclusively by a people of mixed Indian and Spanish or Portuguese descent. The present political divisions of South America are New Granada, Venezuela, Ecuada—three republics formerly united under the name of Colombia; the republic of Peru; the republic of Bolivia; the republic of Chili; the united provinces of La Plata; the republic of Uruguay or Banda Oriental; the republic of Paraguay—all of which republics were originally Spanish colonies; the large empire of Brazil, formerly a Portuguese colony; the district of Guiana, comprehending the British possessions of Demerara, Berbice, and Essequibo; the French possession of Cayenne; and the Dutch colony of Surinam, and the territory of Patagonia. The portions of the South American continent where aborigines are still to be found are Patagonia, which, with the adjacent island of Terra del Fuego, entirely belongs to them; parts of Brazil and Guiana, and various scattered districts in the basins of the Orinoco, the Amazon, and La Plata. A few articles used by these tribes, the remnants of the great race that once inhabited South America, are to be seen in the cases under notice (see Patagonian weapons of offence, and baskets, Cases XXXVI-XXXVII, shelf 3); but the greater proportion of the articles from South America come properly under the denomination of Peruvian antiquities. Among these, besides weapons and household utensils, are a variety of vases and small figures sculptured in stone, some of them with much art (Cases XXXVI-XXXVII). The most interesting of the antiquities have been disinterred from the *huacas*, or ancient tombs of the Peruvians. Believing as they did in immortality and the resurrection of the body, the Peruvians were very careful in burying their dead. They had a mode of embalming peculiar to themselves, which consisted in exposing the body to the intense cold of the high peaks of the mountains, till it became quite dry and withered. Then, if the deceased were an Inca, he was buried with great state in his family tomb; he retained his proper apparel, and his treasures were buried with him. Frequently his wives and servants were immolated at his funeral; and in all cases the house which he had lived in was abandoned. The Peruvian kings, after having been carefully embalmed in the national fashion, were placed in the Temple of the Sun at Cuzco, seated in golden chairs, and splendidly apparelled; 'they sat with heads inclined downwards, their hands placidly crossed over their bosom.' The mummies in Case XXXV, one of which (shelf 1), the dried body of a female, with dark hair, and a necklace round the neck, is fully exposed, and the other (shelf 2) yet retains part of the clothing that once enveloped it, are doubtless specimens of the Peruvian mode of embalming, although both are from New Granada, which was without the strict limits of the Peruvian empire. In the same case, however, is the mummy of a child, which was certainly brought from Peru. These mummies, from their crumbling and shrivelled appearance, form a sickening spectacle; especially the first, which retains so much of the attitude of life. Among the miscellaneous articles found in the

Peruvian Vase.


Peruvian Mummy.

huacas or tombs, are vessels on which Indian corn was placed, a bronze chisel (a specimen of the cutting instruments used by the Peruvians), and silver masks and earrings which ornamented the dead (Case XXXV). The earrings worn by the Incas were of enormous size; they were inserted wholly within the gristle of the ear, which they distended towards the shoulder. The custom of the Peruvians to bury their treasures with them made the discovery of a huaca of some consequence to the early Spanish settlers: in 1576 a Spanish soldier found in one such tomb, afterwards visited by Baron Humboldt, a mass of gold worth a million of dollars.*

In the range of Cases from LI to LXXIV is a collection of articles from the various groups of islands which, under the names of Australasia and Polynesia, lie scattered over the vast surface of the Pacific Ocean from the eastern coast of Asia to the western shores of America. According to the best researches that have been made into the condition of these innumerable islands, they are inhabited by two races of the human family quite distinct from each other—the one dark-coloured, the other light-coloured. 'The dark-coloured variety,' says Mr Angas in his account of Australia, 'have a skin approaching in colour to that of the African races, with hair occasionally curly, and in some instances woolly. Their skulls are of bad proportion, exhibiting a preponderating development of the occipital region; they speak a variety of distinct tongues and dialects; their social relations are in an inferior condition; and they occupy a very low grade in the human family. To this variety belong the present inhabitants of the whole of New Holland or Australia, the now almost extinct natives of Van Diemen's Land, those of New Guinea, the New Hebrides, New Caledonia, Santa Cruz, New Britain, New Ireland, Solomon Isles, Loyalty Island, and the entire population of the Feegee group.' To this variety of the human race naturalists have given the name of *Alfouroos*, or *Austral Negroes*. Of the other variety under notice Mr Angas gives the following account: 'The light-coloured race of the Pacific have a skin of a light copper colour, in some instances no darker than that of the inhabitants of the South of Europe, with regular and pleasing features. Their language appears to be derived from one common root, though their race extends over the islands of the Pacific for a distance of 6000 miles; from the Sandwich Islands of the north-east to those of New Zealand at the south-western extremity of that great ocean. The nations comprehended under this race have superior faculties, both moral and physical; and with some of them a form of government and domestic and social regulations have attained to a very advanced state. Under the head of this great division may be classed the inhabitants of the following groups:—the Marquesas; the Sandwich Islands; the Society Islands, including Tahiti'; the Navigators; the Friendly or Tonga Islands; Savage Island; Easter Island; Roturna; New Zealand, and the Chatham Islands; also the Kingsmills; the Radak and Ralik chain; the Carolines; the Mariannes; the Ladrones; the Pelew Islands; and the various groups to the northwards.' This race may be distinguished from that of the Australians or Austral Negroes by the name of *Polynesians*. They are believed to be identical with the *Malays* who inhabit part of the eastern peninsula, and the islands of the East Indian group proper—Java, Sumatra, Borneo, &c. The theory of ethnologists is, that the great Malay stock, whatever may have been its origin—whether, as some suppose, it proceeded from Asia, or, as others suppose, from America—extended itself at some unknown period over all the islands of the Indian and Pacific Oceans, from Madagascar on the coast of Africa, to the remote Sandwich Islands; and that in some of these islands they found Austral aborigines, whom they either extirpated, or drove into the interior. Nevertheless the Polynesians proper are sufficiently distinct from the Malays to warrant their being named apart, and accordingly the curiosities that have been brought by our voyagers from the South Seas may conveniently be divided into three classes—those illustrative of the manners and customs of the Malays proper—that is, of the inhabitants of Sumatra, Java, Borneo, and the other islands of the East Indian group; those illustrative of the manners and customs of the Polynesians proper—that is, of the inhabitants of the numerous groups of the Pacific, from New Zealand to the Sandwich Islands; and those illustrative of the manners and customs of the Alfouroos, the degraded aborigines of the Australian groups. In the cases under notice, the three classes of articles are confusedly ranged together; the majority of the articles, however, are of the second class. Of Malay curiosities there are a few, such as the model of a Malay proa or canoe, used by the pirates of Borneo (Case LXXII, shelf 1), and a specimen of the Malay blowpipe, a long tube employed for projecting poisoned arrows (Cases LXXIII-LXXIV, shelf 1). The curiosities from the Australian group are more numerous. Two Cases (LXX-LXXI) are devoted to articles from Australia alone; among these, besides rude articles of dress and ornament, are a variety of weapons. Among them one particularly remarks the *womerah*, a throwing stick, a piece of wood about three feet long, with a hook at the end, for throwing spears and darts, and with which the

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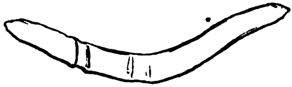
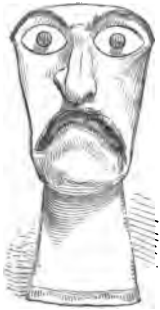
* See Prescott's 'History of the Conquest of Peru.'

Australians aim so well, that they will hit a mark seventy yards distant; and the *boomerang*, a missile of carved wood, which possesses the peculiar property, owing to its shape, of returning to the spot from which it was thrown if the object aimed at is missed. The absence in these cases of any images of gods, indicates the truth of the remark made by all travellers in Australia, that the natives have no formal religion of any kind, the only approach to a religious faith being, it is said, a vague fear of some evil demon, who eats children. Yet Mr Angas found among some tribes a belief in a future state. When men died, these tribes believed their ghosts wandered over the deserts, till at last, after much seeking, they were fortunate enough to find the end of a string hanging down; of this they laid hold, and were snatched up to the other world.


Boomerang.


Polynesian Idol.

Very different from the rude instruments of the Australians are the articles of Polynesian manufacture brought from Tahiti, New Zealand, and other islands of the great Polynesian archipelago. Among these, besides weapons of various kinds, bowls, baskets, paddles elaborately carved, fishing-lines and hooks, ornaments of bone, necklaces of shell, musical instruments, &c. are to be seen excellent specimens of cloth, matting, and feather-work (Cases LI-LVI), rivalling, both in fabric and colour, the manufactures of the negroes. Perhaps the most curious of the articles from Polynesia are some grotesque heads made of red feathers, shells, &c. brought from the Sandwich Islands (Cases LV-LVI, shelf 1), where they were worshipped as idols; and a splendid native dress of feathers, cloth, and mother-of-pearl, from Tahiti (Case LVII). An object of interest to lady-visitors is a bonnet made of plates of tortoiseshell sewn together; the shape is that of a common English bonnet, and the article was doubtless intended as a novelty by some Polynesian lady of fashion. Altogether, the aspect of the various curiosities from the Polynesian islands betoken considerable skill as well as an industrious spirit among the natives, and renders it probable that instead of disappearing before civilisation like the

Tortoiseshell Bonnet.

Australians, they may survive as a distinct race to partake of its blessings.*

The thirteen cases marked XXXVIII-L ought to be looked at last of all, representing, as they do, a condition of semi-civilised life in which we cannot fail to be more deeply interested than in that of Americans, Africans, or Asiatics—the barbarism, namely, of our own European ancestors. The cases are thus briefly designated in the catalogue:—'Various British and Mediæval Antiquities temporarily deposited in this room;' and it is certainly to be desired that the collection were rich enough to fill a separate apartment. At the time when the Romans had extended their power over the countries which surround the Mediterranean, the rest of Europe was inhabited by three distinct barbarian races—the Celts or Gauls, the Teutons or Germans, and the Scythians or Slavonians. The Celts occupied the western portions of the continent, including Great Britain and Ireland; the Germans were masters of Scandinavia and the country between the Rhine and the Danube; and the Slavonians were spread over the north-east in the present regions of Russia, Poland, &c. The Romans, in their efforts to extend their empire over Europe, came inevitably into contact with all three races; only on the Celtic populations, however, did they make any decided impression. About half a century before Christ the whole Celtic territory of Gaul (France) was added to their dominion by Julius Cæsar. From Gaul Cæsar (B. C. 55) passed over into Britain, with the intention of likewise subjugating that island. The following is the account he has himself left us of the condition in which he found it:—'The inland part of Britain is inhabited by those who, according to the existing tradition, were the aborigines of the island (Celts); the sea-coast by those who, for the sake of plunder, or in order to make war, had crossed over from among the Belgæ (a Germanic people occupying the north-east corner of Gaul), and having settled here, had begun to till the land.' From this account we learn that even in Cæsar's time there was a Teutonic and probably German-speaking ingredient in the population of Great Britain settled chiefly on the southern and south-eastern coasts. Later writers have preserved for us a tolerably complete list of all the aboriginal tribes or little nations among whom the island was divided, with the limits of the districts which they respectively inhabited. Of these tribes there were in Great Britain about fifty in all, in Ireland probably about twenty. All the Irish tribes were Celtic; of the British, a few, as has just been said, were Germanic; and of the rest one portion belonged to the same branch of the Celtic race as the Irish; while the others were of the Welsh branch of that race. Each tribe had its own chief, and made wars and alliances as it chose: but over the whole country there seems to have prevailed a certain identity of manners and customs, though not of language. 'The population,' says Cæsar, 'is very great, and the buildings very numerous, closely resembling those of the Gauls: the quantity of cattle is considerable. For money they use copper, or rings of iron of a certain weight. Tin is produced in the midland districts, and iron near the seacoast, but the quantity of the latter is small: the copper which they use is imported. They deem it unlawful to eat the hare, the hen, or the goose; these animals, however, they breed for amusement. Of all the natives, those who inhabit Cantium (Kent) are the most civilised: they do not differ much in their customs from the Gauls. All the Britons, however, stain themselves with woad, which makes them of a blue colour, and gives them a more fearful appearance in battle: they also wear their hair long, and shave every part of their body except the head and the upper lip. Every ten or twelve of them have their wives in common, especially brothers with brothers, and parents with children; and if children are born, they are accounted the children of those by whom first each virgin was espoused.' These remarks apply doubtless chiefly to the tribes of southern Britain; the allusion, however, to the 'inland people, who live on milk and flesh,' extends also to the tribes of Ireland and northern Britain. Both islands seem to have been under the dominion of that peculiar religion called Druidism, to which the Gauls were also subject: what Cæsar says of the Druidism of Gaul, applies, therefore, with equal force to the Druidism of Britain and Ireland. 'The Druids,' he observes, 'are the ministers of sacred things: a great number of young men resort to them for the purpose of being instructed in their system, and they are held in the highest reverence; for it is they who determine most disputes, whether of the state or of individuals; and if any crime has been committed, if a man has been slain, if there is a quarrel concerning an inheritance or the boundaries of their lands, it is the Druids who settle the matter; they fix rewards and punishments, and if any one refuses to abide by their sentence, they forbid him to come to their sacrifices—a punishment among them most severe, for those on whom this interdict is laid are regarded as unholy and accursed: all fly from them, and shun their society. Over all the Druids one presides. Upon his death, if there is any of the other Druids of superior worth, he succeeds; if more than one have equal claims, a successor is appointed by the votes of the Druids, and the contest is sometimes decided by arms. The Druids hold a meeting at a certain time of the year in a consecrated spot, whither assemble all from every part who have disputes to settle. The system of Druidism is thought to have been formed in Britain, and thence carried over into Gaul; and now those who wish to be more accurately versed in it go to Britain for instruction: the Druids do not commonly engage in war, nor do they pay taxes like the rest of the community. They are said, in the course of their instruction, to learn by heart a number of verses, and some remain twenty years under tuition: they do not think it right to commit their doctrines to writing. It is especially their object to inculcate this, that souls do not perish, but after death pass into other bodies; and they consider that by this belief, more than anything else, men may be led to cast away the fear of death, and become courageous. They discuss, moreover, many points concerning the heavenly bodies and their motion, the extent of the universe, the nature of things, the influence and ability of the immortal gods, and they instruct their youth in these matters. The whole nation is much addicted to religious observances; and on that account those who are attacked by any of the more serious diseases, and those who are involved in the dangers of warfare, either offer human sacrifices, or make a vow that they will offer them, and they employ the Druids to officiate at those sacrifices. They have also sacrifices of the same kind on behalf of the state.'

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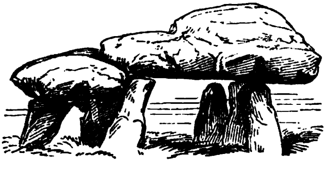
* See 'Russel's Polynesia,' 'Angas's Savage Scenes in Australia,' and 'Keppoll's Borneo.'

Taking this interesting account of the Druids in connection with the observations quoted before, we are enabled very distinctly to conceive the state of primitive Britain and Ireland—two neighbouring islands inhabited, the larger by about fifty, and the smaller by about twenty tribes, for the most part Celtic, each governed by its own chiefs, but all knit together in a certain degree by the profession of the Druidic religion, and the diffusion throughout both islands of the Druidic caste. This *earliest* period of British and Irish history may therefore be aptly designated as the *Period of Druidism*—a period which extended from immemorial antiquity to the conquest of Britain by the Romans. This conquest was effected not by Cæsar, but by Roman generals in the service of the emperors his successors. The effect of the Roman invasion on the two islands may be summed up thus:—The majority of the native tribes of Britain, including the country as far north as the Firths of Forth and Clyde, were subdued and Romanised as the Gauls had been, Roman garrisons and colonies being planted at points over the country; the northern tribes, on the other hand, to the number of fourteen, lying in that part of Scotland which extends from the Firths of Forth and Clyde to the Orkneys, were able to retain their independence, but were compelled, by the pressure of Roman invasion, to unite themselves more closely, so as to form a Gaelic confederacy or kingdom; while in Ireland, still wholly Celtic, the same tendency to union had begun, although less decisively, to manifest itself. To this *second* era of British and Irish history may be applied the name of the *Roman* or *Romano-British Period*. It came to a close in the fifth century, when, on account of the pressure of the German and Slavonian races on the central portions of the vast Roman empire, the Roman legions were obliged to withdraw from Britain to the defence of more important provinces. Into the island thus left defenceless there poured hosts of German adventurers from Scandinavia, Denmark, and Germany Proper. These, uniting with the Germanic ingredient already existing in the British population, became possessed of the whole of Roman Britain, dividing it into seven or more kingdoms. After a while, these kingdoms were consolidated into one under the name of Angle-land, or England, with the exception of the northern portion of the former Roman provinces—namely, the tract between the Tweed and the Forth, which was torn away, and ultimately attached to the kingdom of the northern Celts, among whom also there had, during this period, been an infusion of Germans chiefly from Scandinavia. Ireland, meanwhile, continued in its former condition as an aggregate of several purely Celtic kingdoms. This *third* era of British and Irish history may be named the *Period of the Anglo-Saxons*. It was brought to a close at the end of the eleventh century, when the Normans, a people of Scandinavian origin, who had for several centuries been naturalised in the north of France, invaded the island, and overthrew the Saxon rule in England. In England they settled down as an aristocracy, or ruling class; in Scotland also, where they were received as colonists along with the Anglo-Saxons, whom they had driven north of the Tweed, they acquired property and power; and having thus established themselves over the whole of Britain (with the exception of Wales and the Highlands of Scotland, which remained as fragments of aboriginal Britain, the one Cymbric, the other Gaelic), they crossed over into Ireland, and began to conquer it too. From this period (A.D. 1090–1200) dates the *fourth* and concluding period of British history.

The historic progress of the two islands, it will be observed, has consisted in the gradual extension of the Germanic ingredient in their population. At first all was Celtic; now, the only Celtic portions of the realm are Wales, the Highlands, and considerable tracts of Ireland. In accordance with this sketch of the history of the two islands, British antiquities are either of the Druidic, the Roman, the Anglo-Saxon, or the Norman period. Of the antiquities in the museum, the greater proportion are of the first two periods; they illustrate the condition of society in Britain prior to the sixth century. Ranged in shelves, we here see ornaments, pieces of pottery, bronze statues, shoes, rusty pikes and knives, chains, stone hammers, glass bottles, swords, spoons, flint-arrow heads, measures of metal, bunches of keys, and a variety of other articles scarcely more promising in appearance than those which lie in confusion at the door of a broker's shop, but valuable to us as tangible relics of those times in which our national character and institutions, altered as they now are, must necessarily have had their germ and origin. These articles have been found, the greater part of them, in ancient *barrows*, or sepulchral mounds; but many also accidentally in fields, in the foundations of old houses, or in the channels of rivers, where they had lain till the plough, the spade, or the dredging-machine brought them to light. It is not difficult to distinguish the antiquities of the Druidic from those of the Roman period. The former are much ruder than the latter. Yet some articles which belong undoubtedly to the Druidic period display considerable mechanical skill. This is attributed to the fact, that the Phœnicians, who carried on a commercial intercourse with Britain by sea long before it was known to the Romans, had introduced some of their arts among southern tribes. The introduction of the Greek characters, which the Druids are known to have used in secular writing, is also attributed to the Phœnicians, although it is more probable that these letters reached Britain through Gaul, over which they had been disseminated at a very early period from the ancient Greek colony of Marseilles. The following extract from Mr Fosbroke's 'Encyclopedia of Antiquities' will serve to exhibit the gradual progress of the arts among the ancient Britons first under Phœnician, and then under Roman influence:—'The first Britons,' he says, 'had for offensive arms merely bows, arrows of reeds with flint or bone heads, basket-work quivers, oaken spears and javelins with bone heads fastened by pegs, a flint battle-axe called *bwyelltary*, and a *cat*, or four-edged oaken club. After the Phœnicians had taught them the art of manufacturing metals, the heads of the spears, javelins, and battle-axes were imitated in bronze—that is, copper and tin mingled; and this marks a second era. The first British body-armour was of skin, which was exchanged after the Roman conquest for a leathern cuirass—an armour which continued in use till the Anglo-Saxon period. The first shields were of wicker-work, covered with leather, afterwards they were of bronze. Tacitus mentions long swords and targets as used by the Caledonians.' The progress of improvement is still more discernible in the specimens of British pottery which remain. 'Strabo says that the

Britons imported their pottery by barter for lead, tin, and skins; but there scarcely seems a doubt that the Britons, like the Gauls, had also a pottery of their own previous to the arrival of the Romans. These British vases were made by the hand, of very rude materials, and are so imperfectly baked, as to shiver in pieces on exposure. The ornamental patterns on some of them were evidently worked with the hand by means of a pointed instrument, and not a mould.' The Roman-British pottery, on the other hand, 'is beautifully moulded, finely glazed, and richly ornamented:' in this period also there were elegant glass vessels. If in these smaller arts an improvement took place in consequence of the Roman invasion, we may well suppose that in such more important arts, as house-building, agriculture, weaving, &c. the improvement was equal. At first, the British houses were built of stakes interwoven with wattling like hurdles, and thatched with reeds or straw; in shape they were 'either cylinders with an arched door, or exact facsimiles of the great tea-cannisters seen in grocers' shops, the orifice where the lid shuts being for the emission of smoke;' and they were built, not together in streets, but at intervals along a river's bank, in the midst occasionally of a small cultivated patch of ground. Caves were also used as houses. After the Roman conquest, the dwellings were much improved both as regards form and material, and articles of furniture, till then unthought of, came into use. Various specimens of the ring-money mentioned by Cæsar have been found in barrows. These are of British manufacture; but the bronze statues exhibited along with them, of which the finest is a miniature statue of the god Harprocrates, found in the bed of the Thames during the excavations for the foundation of London Bridge, evidently belonged to Roman residents in Britain, and were either made by them or brought from abroad.*



Cromlech.

Turning from the cases of British antiquities, the visitor sees on the floor in the middle of the room models of various British *cromlechs* — the Chun Quoit of Cornwall, the Trevethy Stone near St Clea, the Double Cromlech at Plas Newydd, Anglesea, &c. These cromlechs (from two Celtic words, *crom*, a circle, and *leh*, a stone) are rude monuments in this fashion:— four or more stones are placed in a rude circle, so as to enclose a small space, and over the whole is laid one flat stone, forming altogether a small chamber. After many vain theories about these objects, they are now fully ascertained to have been chambers of repose for the dead at a time prior to the use of metal in Europe. They prevail in Denmark, France, Britain, and Ireland. Besides the models of cromlechs, there are on the floor of the room, intended to be looked at apart, various objects of interest—models of the Church of the Holy Sepulchre at Jerusalem, and of the Church of the Nativity at Bethlehem; a model of a movable Indian temple; a large Chinese bell, covered with inscriptions, from a Buddhist temple near Ningpo; a model of Lord Nelson's ship the Victory, and underneath it a piece of the timber of the ship, with a 40-pound shot in it, lodged there in the battle of Trafalgar, on the 22d of October 1805; and lastly, omitting other articles, a beautiful plaster cast, modelled by the sculptor Flaxman in 1818, and intended to represent the shield of Achilles, according to the elaborate description of it given by Homer in the seventeenth book of the 'Iliad.' Leaving these objects and the Ethnographical Room, we make our way through the range of galleries devoted to natural history, to

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* Fosbroke's 'Encyclopedia of Antiquities.'

II.—THE EGYPTIAN ROOM.

All readers of history know that one of the most ancient nations, if not *the* most ancient, on the earth, was that which had its seat in the fertile valley through which the Nile flows. It is believed, indeed, by some that the Chinese and Indian civilisations were formed in the remote East at a date little less remote than that at which Egypt began to exist as a nation; but even if this supposition were better founded than it is, the antiquities of Egypt would still claim a larger share of our interest, seeing that this country was at least the most ancient on that portion of the globe to which we more peculiarly belong; and on which human activity has ever most strongly manifested itself. It is fortunate, accordingly, that, through the industry of inquirers applied both to the investigation of the accounts of the ancient Egyptians handed down to us by the classical authors, and also to the study of the actual remains which the Egyptians have left behind them on the soil which they occupied, we have acquired the means of forming a tolerably vivid picture of their life and manners.

The entire population of Egypt at the most flourishing period of its history—that is, about five or six centuries before Christ—has been estimated at 7,000,000; and we shall not be far wrong if we conceive that, during the long period of the existence of Egypt as a nation, its population varied between 7,000,000 and 2,000,000—never exceeding the former, and never falling below the latter number. These millions lived in towns, villages, and hamlets, scattered in prodigious number (Herodotus estimates them at 20,000 in his time, about B.C. 450) along the valley of the Nile. This valley in its broadest parts is hardly more than ten miles wide; and its whole length from its mouth to the Cataracts of Syene, which form the southern limit of Egypt, does not exceed 500 miles. Egypt is therefore best conceived as a long, narrow tract of fertile land, thickly peopled, with a broad river running through it, by whose periodical rise the country was completely flooded, so that only the higher grounds on which the villages were situated remained above water. It was on this annual flooding of the river that the land of Egypt depended, and still depends, for its fertility. The rise of the waters begins late in June, and ends in November, when the husbandman instantly scatters his seed on the drenched fields. In a few weeks they are covered with harvest. In May the whole country is again hot and parched, and the inhabitants look anxiously for the return of the inundation.

Ancient Egypt was naturally divided into three parts:—Upper Egypt, or Thebais, the capital of which was Thebes; Middle Egypt, or Heptanomis, the capital of which was Memphis; and the Delta, or Lower Egypt, including all the flat and marshy country through which the Nile discharges itself by its various mouths into the Mediterranean. It has been supposed that this last is a formation caused by the gradual deposit of mud from the river, and that primitive Egypt included only Thebais and Middle Egypt. Considering the enormous time that it would require for the Nile, at its present slow rate of deposit, to accumulate a quantity of mud sufficient to form the Delta, this supposition appears untenable; it is nevertheless true that Upper and Middle Egypt were originally the chief provinces, and that the Egyptians, not being a maritime people, did not fully develop the resources of the Delta till a later period. The progress of Egyptian culture seems, in fact, to have followed the course of the river, beginning in Upper Egypt, and advancing towards the sea.

Regarding the origin of the Egyptians, who were clearly not a pure African or Ethiopian race, various opinions have been held. Some suppose them to have been of Semitic-Ethiopic origin—that is, the result of a mixture of the Negro with the Arabic or Syriac race; others, observing in them a union of the Semitic and the Indian characteristics, maintain a theory corresponding. To this second class of ethnographers belongs Chevalier Bunsen, whose arguments are chiefly derived from an examination of the Egyptian language. Whatever be the origin of the Egyptian race, it is certain at least that we have no account of any people preceding them in the possession of their country. The earliest of human records represent them as not only already settled in it, but as exhibiting all the evidences of long possession — laws, cities, wealth, and luxury. According to the Scriptural account, when Abraham visited Egypt (B.C. 1920), the Egyptians were a flourishing nation. It is necessary, therefore, to suppose that they were the aborigines of the country; and that scarcely had they settled in it, on the dispersion of races over the globe, when, either by virtue of some physiological superiority to other peoples, or in consequence of the natural advantages of the soil, they started forward in the career of civilisation, leaving the rest of humanity in that part of the world far behind. Their own historical records were to this effect :—At first, they said, their land was the abode of gods, giants, &c.; then there came a great king named Menes, who built Memphis, and founded the Egyptian state. After him there reigned in succession 330 sovereigns, forming a series of twenty-six distinct dynasties, each dynasty being named from the city from which the ruling family was taken—as Memphites from Memphis, Saites from Sais, and so on. Of these dynasties, which would carry back the antiquity of Egypt incredibly far, the first are doubtless legendary, and only in the fifteenth or sixteenth does light begin to glimmer. Abraham's visit is supposed to have taken place in the fifteenth dynasty. One of the first kings or Pharaohs whose names are known was Osertesen I. of the sixteenth dynasty, who reigned B.C. 1740. It was during this dynasty, about B.C. 1706, that Joseph, and afterwards Jacob and his family, came to reside in Egypt; and it was in the reign of Thothmes or Thutmosis III., a Pharaoh of the eighteenth dynasty (B.C. 1491), that the exodus of the Israelites took place. Perhaps the most celebrated of all the kings of Egypt was Remeses II., or the Great (called by the Greeks Sesostris), a Pharaoh of the same dynasty, who lived about B.C. 1350, and during a reign of forty years, extended the Egyptian dominion not only far into Africa, but also over a portion of Western Asia. From his reign till B.C. 525 was the most flourishing age of Egypt. In the last-mentioned year, during the reign of Psammenitus, a king of the twenty-sixth dynasty, the country was invaded and subdued by the Persians, who continued to govern it till the overthrow of their empire by Alexander the Great, B.C. 330. On the death of Alexander, Egypt formed one of the Greek kingdoms into which his empire was divided. It was appropriated by one of his generals named Lagus, whose descendants, all bearing the name Ptolemy, ruled it till the year B.C. 30, when, on the death of the celebrated

Cleopatra, the last of the family of the Ptolemies, it was annexed as a province to the Roman empire.

Egyptian antiquities consist, therefore, of four distinct classes, according to the epochs to which they belong:—antiquities of the *period of the Pharaohs*, while Egypt retained its independence; antiquities of the *Perso-Egyptian period*, while the country was subject to the Persians; antiquities of the *Graeco-Egyptian period*, or the period of the Ptolemies; and antiquities of the *Romano-Egyptian period*, while Egypt was a Roman province. Of antiquities which are durable in their nature, such as sculptures and architectural remains, there are still extant many that belong to the earliest era, reaching back even as far as the eighteenth dynasty, or B.C. 1500; but many of the articles of a more perishable description belong, as might be expected, to the later epochs. Even of this class of objects, however, many are indubitably as old as the times of the Pharaohs. Besides, as, even after Egypt had become subject to foreign rule, the great mass of the population continued to practise their native customs, no people being more conservative in their dispositions than the Egyptians, these minor antiquities of the later epochs are quite as serviceable in illustrating the age of the Pharaohs as if they had belonged to it.

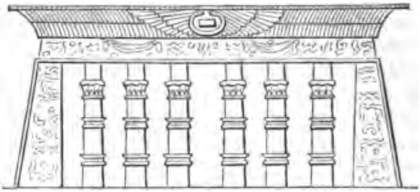
One of the features of resemblance between Egypt and India was the system of castes common to both countries. The number of the Egyptian castes has been variously stated by ancient writers: the most probable account makes them five—namely, the sacerdotal caste, the military caste, the agricultural caste, the caste of townsmen or artificers, and the *plebs* or common people. 'The *first* caste,' says Sir Gardner Wilkinson, 'was composed of the chief priests or pontiffs, as well as of minor priests of various grades belonging to different deities, prophets, judges, hierophants, magistrates, sacred scribes, royal scribes, hierostoli, or keepers of the sacred robes, hierophori, or carriers of the sacred emblems in processions, keepers of the sacred animals, masons of the sacred order, sacred sculptors and draughtsmen, beadles, and other functionaries of the temples.' This caste constituted about the same proportion of the Egyptian that the Brahmins do of the Hindoo population—that is, they amounted in all to several hundred thousands of individuals, dispersed over the country, filling all situations of importance and responsibility. The military caste consisted in the later times of Egyptian independence of 410,000 soldiers, with their families; they were stationed in particular districts of the country, where they had lands assigned them for their support, and when there was occasion for their services they were summoned together. A considerably larger fraction of the population were the third caste, which, besides farmers, husbandmen, and gardeners, included huntsmen, boatmen, and others. Larger still would be the caste of townspeople, including tradesmen, shopkeepers, musicians, builders, carpenters, sculptors, potters, public weighers, notaries, clerks, &c.; while the lowest caste was probably the most numerous of all, comprehending, as it did, shepherds, poulterers, fowlers, fishermen, labourers, and servants. The Egyptians had a prejudice against the profession of shepherds, on account of a tradition of an ancient conquest of their country by Assyrians who led that mode of life; and of all classes in the community, they had the greatest abhorrence for swine-herds.

The system of castes, so repugnant to our ideas of liberty, accorded well with the Oriental character of the Egyptians, and occasioned no social discontent. The priests moved about among the people, not hated as oppressors, but venerated as the natural governors whom the gods had appointed, and the whole tenor of whose education fitted them to hold supremacy. So essentially were the functions of government conceived to be bound up with those of the priesthood, that every monarch of Egypt, on his appointment, was required, if he was not a priest by birth, to become one by admission into the priestly mysteries. During his reign, too, the power of the king was limited by that of the priests, whose organ he was in almost all cases—sometimes, indeed, their nominee—and who always acted as his ministers and official advisers. Under the king, the country was administered, in later times at least, by thirty-six governors of the priestly or military caste, corresponding to the thirty-six *nomes* or provinces into which the whole country was divided: Upper Egypt and the Delta into ten each, and Middle Egypt into sixteen.

The mode of life among the Egyptians varied according to the caste and rank of the persons, just as in modern society. In the following general description of Egyptian manners, much must therefore be left to the imagination of the reader:—

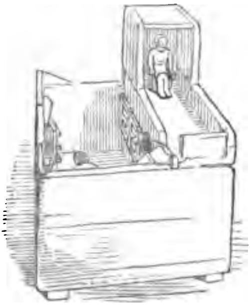
First, as regards Egyptian buildings; these were of two classes —public buildings, and private residences. A full description of the public buildings of the Egyptians, including their temples, both built and excavated, would involve a treatment of the vast subject of Egyptian architecture; suffice it at present to say, that 'in character the Egyptian is the very reverse of the Gothic style of building: the one aims at ponderous massiveness, and affects low proportions and great extent of unbroken horizontal lines; while the other affects exactly the contrary—slenderness and loftiness, forms aspiring upward, and extreme diversity of outline.' The Greek architecture is intermediate between the two.

In the great Egyptian temples there was accommodation for the officiating priests and their families; still, the greater proportion of the priests and other wealthy Egyptians lived in houses of their own, either country villas situated on the banks of the various canals that communicated with the Nile, or town residences. The country villas of the very wealthy were splendid buildings, somewhat in the temple style as regarded their exterior form, with attached gardens, offices, ponds, &c. all surrounded by a wall. 'The houses in the towns,' says Sir G. Wilkinson, 'varied in size as well as plan; but, judging from the ruins that remain, the streets were laid out very regularly; nor does there appear to have been that mixture of large houses and low hovels so frequently met with in Eastern towns. As is usual in hot climates, many of the streets were narrow; and few, except the principal ones, were large enough to allow the passage of a chariot.' The houses seldom exceeded two storeys in height; in Thebes, however, on account of the value of the ground in so populous a city, many of them were built higher. The smaller houses were contiguous, so as to form an unbroken wall on each side of the street; but those of rich citizens sometimes stood apart, with walls round them, and a row of trees in front. The universal building material—except for the temples or important public buildings, which were of stone (usually the red granite of the country)—was sun-dried brick, a very cheap article, of the manufacture of which the government had a monopoly, employing in it hosts of captives. The houses of the wealthy, however, sometimes had stone porticos or doorways; and the outside was frequently painted or plastered. The following may serve as the description of the usual residence of an Egyptian gentleman living in Thebes, Memphis, or any other large town:—From the main door of the house (on each side of which was a smaller door for servants) there projected into the street a portico 12 or 15 feet high, supported on two pillars, like the porticos common in the superior dwelling-houses of London and other towns. Tied round the pillars, just below the capitals, were ribbons or banners by way of ornament: passing



Façade of Egyptian Temple.

these, on his way in, the visitor stood at the house-door, on the lintel of which, or on the side-posts, where we place our bell-handles, he might read the name of the occupant inscribed in the common Egyptian character. On entering through the doorway, the visitor found himself in an open court, on the other side of which, immediately in front of him, was a small parlour or pillared space, with an awning over it, serving as a receiving-room. Met here by the master of the house, he was led through a door behind it into an inner court planted with trees. From this court passages both on the right and left led into the apartments, of which there would be six or seven on each side, with a similar number on the upper storey. Such was a common arrangement; the distribution of the rooms within varied according to taste. In houses of a more common description the apartments were simply ranged round a square court opening from the street; and for a still lower class of the population one court might serve for several families, the several apartments into which it led being let out as separate domiciles. In the country single huts rudely fashioned of clay sufficed for the shepherds and herdsmen, or as offices attached to farm-steadings. Of this description seems to have been the house, if it may be called such, of which there is a native model in the museum (Cases XIV-XIX, division 2), entitled 'The model of a granary and yard.' In this model a female is represented busy making bread in an open courtyard, on one side of which are three small store-rooms, on the ground-floor, with a staircase leading to a small chamber on the flat roof, in which a man is seated. This curious model is said to resemble houses still found in some of the villages of Egypt, in which the only portion used as a habitation is the little chamber on the roof, the rooms below being used for goods. In Proverbs xxi. 9, 'It is better to dwell in a corner of the house-top than with a brawling woman in a wide house,' there may be an allusion to this, the style of lodging used, we suppose, by single farm-servants, as contrasted with the superior accommodation of their married masters. Probably, however, the model in question is intended only to represent a granary with a place on the roof where the master could sit and watch his servants. A curious circumstance is mentioned respecting this model. When found at Gournah, in Upper Egypt, the store-rooms were full of grain, which was kept



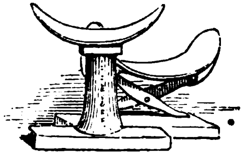
Model of Granary and Yard.

quite safe till it was smelt out by a rat in Leghorn, who, unrestrained by any imaginative feeling, ate it up.

The chambers in the lower storey were used as store-rooms; but on the same floor were often sitting-rooms, &c. The chief rooms, such as those for entertaining guests, and the bedrooms, were on the upper storey. In summer, as in modern Egypt, the inhabitants slept on a covered terrace on the roof. The floors of the various apartments were of stone, earth, or some composition; the ceilings were either of stone, in which case they were commonly arched, or of wood laid across in rafters. The arch, the invention of which by the Egyptians has been traced to the scarcity of wood in their country, was known as early as B.C. 1540. In wealthy houses the ceilings and the walls of the principal apartments were beautifully stuccoed and painted; and judging from the specimens which remain in tombs, the taste of the Egyptians in this species of decoration was extremely good. The windows being few and small, and, like the doors, fitted with folding valves, the apartments must have had a darkened appearance; but for this there was a compensation in the consequent exclusion of heat.

As the houses themselves, so also their furniture, varied with the rank of the owner. In the sitting and dining-rooms, besides tables of various shapes, sometimes of metal or stone, but more frequently of wood, there were chairs, stools, *fauteuils*, and couches of many varieties. Of these there are some specimens in the Museum (Cases XIV-XIX., divisions 1 and 2)—square stools, camp-stools, high-backed chairs, and chairs with rush bottoms, &c. One is a stool with four legs, made of ebony, inlaid with ivory; but, generally speaking, the specimens are of a very ordinary description of second-class furniture: 'they probably belonged,' says Sir G. Wilkinson, 'to persons of inferior station, or to those rooms which were set apart for casual visitors.' One or two are evidently workmen's stools. The appearance of furniture of a finer description we are left to infer from the sculptures, &c. in which chairs and couches and ottomans are represented of the most elegant shapes, covered with richly-dyed cloth or painted leather. In most cases the height of the seats was about the same as in modern English furniture of the same kind; sometimes, however, the seats were very low, and in Egypt, as in the East generally, it was not uncommon to kneel or sit cross-legged on a mat on the floor. A curious article of Egyptian furniture, of which there are also specimens in the museum, was the *uls*, or rest for the head, serving the same purpose as our pillow. It consisted of a concave or semi-cylindrical piece of wood, pottery, ivory, alabaster, or some such hard substance, supported on a strong shaft about half a foot high, and sometimes covered with hieroglyphics.

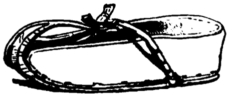
This singular substitute for a pillow, or rather primitive form of pillow, was not peculiar to the Egyptians. It is still in use in Abyssinia, Ashantee, and other parts of Africa; and in the Ethnographical room of the museum there are three head-rests of the same description, although not quite of the shape of the *uls*—the one from China, and the other two from Otaheite. The stuffed pillow is therefore by no means a dictate of nature, but rather an invention for the sake of increased comfort. That the Egyptians sometimes used cushions, however, whether as pillows or for other purposes, is well known; and of such a cushion, stuffed with feathers of water-fowl, there is a specimen in the museum. The beds of the Egyptians consisted of mats, laid either on the floor or on low bedsteads of wicker-work, of wood, or, in some cases, of bronze.



Head Rests.

The ordinary dress of an Egyptian gentleman consisted of a long tunic or robe of linen, with or without sleeves, reaching from the neck almost to the ankles, where the threads of the woof were left so as to form a fringe; and under this a small kilt or apron, also of linen, wrapped round the loins, and fastened at the waist. The name of the tunic, Herodotus informs us, was *calasiris*. In the museum (Cases XX-XXI, division 1) there is a specimen of this robe, without sleeves, and about four feet three inches long; by the side of which is the basket of platted palm-leaves in which it was found. Workmen and poor people were content with the kilt alone; and in most of the paintings in which slaves or servants are represented at work this is the only article of dress which they wear. In the museum (Cases XX-XXI, division 1) there is a working-man's leathern apron, worn probably by particular trades, as by shoemakers amongst us. In addition to the tunic, the rich sometimes wore an upper vest or shawl of white woollen; but it was not lawful for them to be buried in such a garment, or to wear it in a temple. The tunic was frequently embroidered; and there were varieties of the form and mode of wearing, according to the occasion on which it was intended to be used. The dress of the king and of the higher priests was of the finest linen, and highly ornamented. The dress of Egyptian women was of linen, like that of the men, and consisted of a long robe or gown, descending from the neck to the ankles, and over this a petticoat secured at the waist by a girdle. Both gown and petticoat were frequently of rich coloured patterns; and in the form and mode of wearing there was room for variety. Of the shoes and sandals worn by the Egyptians there are numerous specimens in the museum (Cases

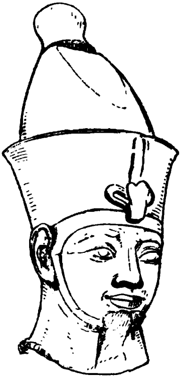
XX-XXI, division 3 and 4). They were of various forms, either flat or peaked at the toe; and were made of woven palm-leaf, of papyrus-stalk, or of leather. Egyptian ladies had their sandals finely painted and embroidered: it was customary for all classes, however, to go barefooted on many occasions. It was the universal custom of the men in Egypt, except when in mourning, to keep the head and beard closely shaven: this was considered a point of cleanliness—a virtue for which the Egyptians were celebrated—and nothing disgusted them more than the Grecian fashion of wearing the hair and beard long. The heads of the children were shaven from a very early age, and both children and grown-up persons of the lower ranks were accustomed freely to expose their heads thus naked to the heat of the sun—a practice to which Herodotus attributes the hardness of the Egyptian skulls as compared with those of other nations. When a covering for the head was used, it consisted either of a close cap, of which there is a specimen in the museum (Cases XX-XXI, division 1), made of a single piece of leather cut into network, or of a wig. Small wigs were worn within doors by the rich, but on important occasions they wore a large and voluminous wig, elaborately plaited and curled. Of such a wig there is a specimen in the museum (Cases XIV-XIX, division 2), which, from its size and glossiness, is one of the most interesting objects in the collection. 'It may appear singular,' says Sir Gardner Wilkinson, 'that so warm a covering for the head should have been adopted in the climate of Egypt; but when we recollect that they always shaved the head, and that the reticulated texture of the groundwork on which the hair was fastened allowed the natural heat to escape, while the hair afforded protection from the sun, it is evident that no better covering could have been devised, and that it far surpassed in comfort and coolness the modern turban, which, however, is agreeable in hot weather.' As the Egyptians wore artificial hair on their shaven heads, so for their shaven chins they had artificial beards, the shape and size of which were determined by the rank of the wearer. The beards of private individuals were about two inches long; a king's beard was longer, and square at the bottom; and in the figures of the gods the beard is turned up at the point, a form which it was unlawful for any one to imitate. On ordinary occasions the king



Egyptian Sandal.

Egyptian Wig.

wore a wig of the common kind, but sometimes he wore his crown or regal cap, of the annexed shape, which is a union of two distinct forms—the one representing the crown of Upper, the other the crown of Lower Egypt; a circumstance which signifies that at one time the two portions of Egypt were separate kingdoms.



The custom of shaving the head was confined, it should be observed, to the men; the women wore their own hair, carefully and often elegantly braided and plaited. Of the combs with which they dressed their hair, and the studs and pins with which they fastened it, there are various specimens in the museum (Cases XX-XXI). The former are generally of wood, with two rows of teeth, one larger than the other. Beside these are to be seen specimens of their mirrors—circular plates of some lustrous metallic composition (much tarnished by age), the chief ingredient of which was copper, with a small handle attached. The looking-glasses of the women among the Israelites, of which Moses made the laver of brass for the tabernacle, nay, those earlier looking-glasses still which were made by Tubal Cain, and used, as a lady author surmises, by the ladies in Noah's ark (Exodus xxviii. 8), were doubtless of this description; and it was only among the later Romans that polished steel and glass came to be used as mirrors. Among the articles of an Egyptian lady's toilet were a variety of boxes, and vases of alabaster, of ivory, wood, shell, and other substances, containing unguents and perfumes, to be used in dressing the hair, or in anointing the body after a bath. Nor was the use of unguents confined to the women; the practice of anointing the body was universal among the Egyptians, and the priests, whose ablutions were frequent, were accustomed to bestow the most scrupulous attention on their persons. In some of the pots and vases in the museum there are remains of the ointments which they contained; and there is one in the museum at Alnwick Castle which still, after so many ages, retains its scent. It is a curious fact that Chinese scent-bottles have been found in Egyptian tombs of the time of the Pharaohs. Among the various vases, boxes, and bottles that figure in the cases as articles of the Egyptian toilet, a large number were used for containing *ithem*, a metallic substance (usually antimony, or the black oxide of manganese) similar to the modern *kohl* of the East, with which the Egyptian ladies stained their eyelids and eyebrows of a deep black colour.

These kohl-bottles are of all shapes and sizes—some containing several cells, as if for the reception of different kinds of colouring matter, and attached to most of them are the pins with which the colouring matter was laid on.

Colour Bottles.

Besides the ordinary articles of dress, there were many articles of ornament and fashion worn by the Egyptians; as earrings, armlets, bracelets, anklets, finger-rings, chains, necklaces, plates for wearing on the breast, &c. Of such bijouterie there are a considerable number of specimens in the museum (Cases LXXVII, LXXXIX, and XC, CI, in the centre of the room). The materials chiefly used for jewellery was gold and precious stones; but bronze, glass, ivory, &c. were used by the poorer classes. 'Women,' says Sir G. Wilkinson, 'wore many rings, sometimes two or three on the same finger; the left was considered the hand peculiarly privileged to bear those ornaments, and it is remarkable that its third finger was decorated with a greater number than any other, and was considered by them, as by us, *par excellence*, the ring-finger, though there is no evidence of its having been so honoured at the marriage ceremony. They even wore sometimes a ring on the thumb. Some rings were simple, others were made with an engraved stone; and they were occasionally in the form of a snail, a knot, a snake, or some fancy device. Handsome and richly-ornamented necklaces were a principal part of the dress both of men and women. They consisted of gold, or of beads of various qualities, substances, and shapes, disposed according to fancy. The sole museum of Leyden possesses an infinite assortment of such objects which were once the pride of the ladies of Thebes.' Many of the gems of the Egyptians were worn as amulets; and such amulets were also hung round the bodies of the dead. The most common variety was a stone, usually basalt or porphyry, cut in the form of the *scarabæus*—a kind of beetle, whose habit of gathering a ball of earth with its hind-legs, and therein depositing its eggs, made it be considered a fit emblem of the Divine power impregnating the world. There is a collection of scarabæi and other amulets in cases XCV and XCVI: some of the scarabæi are plain; but the greater number are covered with inscriptions in hieroglyphics, some of which contain the names of the wearers. Amulets in the shape of scarabæi were not confined to Egypt; they were used in many parts of the ancient world. The scarabæus, says Mrs Hamilton

Scarabæus.

Gray, was to the ancients what the crucifix is to Roman Catholics.

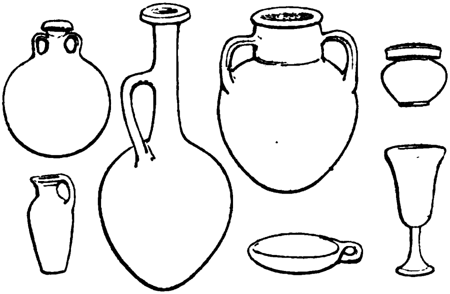
Having made his toilet, the Egyptian gentleman, if he were to attend a party in a friend's house, would call for his cane or walking-stick (the height of which was from three or four to six feet, according to taste), and set out. Arrived at the house, he would leave his cane, which had his name engraven on it, with a servant at the door, and having been ushered in, he would find other guests assembled, some of whom had walked like himself, and others had come in palanquins carried by their servants. Later still would come some man of consequence in his chariot, driven by himself in a standing posture, while his servants ran by his side carrying his sandals, &c. and one went before ready to knock at the door, and receive the reins when his master dismounted. Such a scene is actually represented on a painting from a tomb at Thebes. Riding on horseback seems to have been rare among the Egyptians. When the guests arrived, which, if the invitation was to dinner, would be about mid-day, water was brought to wash their hands: ewers and basins of costly material and elegant shape were used for the purpose. After a little while the guests entered the dining-room, when each, on being seated, was anointed on the head by a servant, and had a chaplet of flowers placed on his head, as well as a necklace of flowers round his neck; in addition to which, each had a single lotus-flower given him to hold in his hand. Fresh flowers and garlands lay on stands near, to replace the others as occasion required; the apartment also was perfumed with myrrh, frankincense, or other aromatics. Wine was then offered before dinner, the appearance of which was somewhat late, from the fact that it was customary to prepare many of the dishes after the arrival of the guests. Dinner was at length served; but the repast was not begun till grace had been said, and some of the viands set apart for the gods.

In ancient Egypt the women dined with the men, sometimes at a separate, but occasionally also at the same table; and altogether, greater liberty was accorded to their sex than among the Greeks. Nor did the Egyptians recline at table like the Greeks and later Romans; they sat on chairs, stools, or mats, the master and the mistress of the house generally together on a double chair, to the leg of which a monkey or a dog was sometimes chained. The tables were low, and generally round in shape, and the dishes were placed on them by the servants in succession; for a numerous party there must have been a row of such tables. Neither knives nor forks were used, but each helped himself from the central dish with the fingers of his right hand. Condiments, &c. were handed round in separate vases. For liquids spoons were used;

and a knife was sometimes necessary to assist in carving. In consequence of the variety of the dishes, and the slow manner of serving, the meal was long protracted; servants, of whom one or more attended each guest, meanwhile handing wine frequently in goblets with handles for the men, and in small vases for the women. Conversation meanwhile proceeded, and acquaintances drank each other's healths. In one painting some ladies seated together are represented talking about their earrings, if one may judge from their gestures; and in another described by Sir Gardner Wilkinson, a guest having got somewhat tipsy, is bringing down a large column with a crash among the dishes, while the company are trying to escape, or uplifting their hands in horror. That, in spite of the injunctions to temperance delivered by the priests, intoxication was not an unfrequent vice in Egypt, is proved by many other paintings, in which men are seen carried home by their servants from a party, or, worse still, ladies are exhibited in the act of falling sick at table. Such scenes, however, would occur only after the repast was over, and when the company had resolved themselves into a drinking party. Ere this took place, a strange custom was always complied with. 'Just as the company is about to rise from the repast,' says Herodotus, 'a small coffin is carried round containing a perfect representation of a dead body; it is in size sometimes of one, but never of more than two cubits, and as it is shown to the guests in rotation, the bearer exclaims, "Cast your eyes on this figure; after death, you will be like it; drink then, and be happy!"'

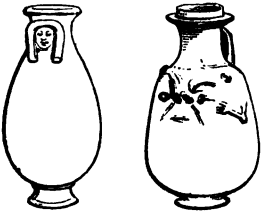
The viands used by the Egyptians were very various. Herodotus mentions bread of spelt, fish dried or salted, and quails and ducks, as their usual fare, with a liquor fermented from barley (beer) for drink. But besides these, the flesh of various animals, such as the ox, the goat, the gazelle, &c. was used; the restrictions from certain kinds of flesh, imposed by their religion, being for the most part of force in special districts. Large flocks of geese were kept in all parts of Egypt for the consumption of the table; and of fowls generally, the Egyptians appear to have made greater use than of any other kind of animal food. Hence their plan for artificially hatching eggs in ovens, by which an enormous increase was effected in the supply of poultry for the market. Fish was used by all classes except the priests; but the staple food of the poor consisted of vegetables, of which no country produced a greater variety than Egypt. Numbers of herbs, among which the lotus and the papyrus deserve mention, grew spontaneously in the marshes of the Nile, and were eaten both raw and cooked, along with bread, milk, cheese, and fruits, especially that of the date palm. So plentiful was the supply of vegetable food in Egypt, that, according to the Greek author Diodorus, it cost almost nothing in that country to bring up a child. The poorer Egyptians, he says, 'feed their children very lightly, and at an incredibly small cost, giving them a little meal of the coarsest and cheapest kind—the pith of the papyrus, baked under the ashes, with the roots and stalks of some marsh-weeds, either raw, boiled, or roasted; and since most of them are brought up, on account of the mildness of the climate, without shoes, and indeed without any other clothing, the whole expense incurred by the parents does not exceed twenty drachmæ (thirteen shillings) for each child; and this cheapness is the true cause of the populousness of Egypt.' Notwithstanding the abundance of wheat of the finest quality in Egypt, wheaten bread seems to have been used only by people in good circumstances; and certain kinds of vegetables, especially onions, were forbidden to the priests. Besides the wine of the grape, of which there were many descriptions, both native and imported, and the beer mentioned by Herodotus, the name of which was *lythus*, and which was celebrated for its excellent flavour, the wealthy Egyptians used at table other beverages, such as palm-wine and sweet liquors. Our information about such matters, one would think, could be derived only from the notices of Egyptian customs in ancient writers, and from the paintings on Egyptian tombs; and yet, strange as it may appear, we are able even at the present day to satisfy our eyes with the actual inspection of articles of food that were cooked for Egyptian tables two thousand years ago. Of Egyptian wine or beer, it is true, not a drop has survived; but of solid articles of food there is a sufficient quantity in the British Museum alone to furnish an antiquarian meal for a moderate party. A visitor, looking at division 3, in Cases XXXIII-XXXV, will see, in the first place, a small rectangular stand of papyrus with two stages, on each of which is a small duck trussed, while beneath there are several round cakes of bread. That the ducks are genuine Egyptian ducks, and the bread genuine Egyptian bread, there cannot be a doubt, as the stand was found in a private tomb at Thebes, where it had lain for at least twenty centuries. Near the stand, and taken from other tombs, there are other viands of equal antiquity and equally shrivelled appearance—biscuits, cakes, figs, grapes, dates, ears of wheat, barley, &c. With specimens of wheat and barley thus preserved, the experiment has been tried of sowing them, and in some cases with perfect success—the ears springing up in English soil almost as readily as if they were of last year's growth.

In Cases XXII, XXIII, XXIV, XXV, XXVI, XXVIII, and XXIX, there is a large collection of vases, jars, bowls, cups, goblets, bottles, &c. all evidently used for holding liquids, articles of food, preserves, unguents, and such-like; while in Cases XL, XLI, there is a smaller assortment of spoons, ladles, &c. of ivory and wood. To describe the exact uses of these, or to arrange them in their proper places in the pantry, in the wine-cellar, or on the dining-table of an Egyptian household, would require a more exact knowledge of the minutiæ of Egyptian life than we yet possess. Suffice it to say, that from no part of a collection of their antiquities does one derive a higher idea of the social refinement to which the Egyptians had attained than from their vases. 'Many of their ornamental vases,' says Sir G. Wilkinson, 'as well as those in common use, present the most elegant forms, which would do honour to the skill of a Greek artist. So strong a resemblance do they bear to the productions of the best epochs of ancient Greece, both in their shape and in the fancy devices which adorn them, that some might even imagine them to be borrowed from Greek patterns; but they are purely Egyptian, and were universally adopted in the valley of the Nile long before the graceful forms we admire were known in Greece; some, indeed, of the most elegant date in the early age of the third Thothmes, a monarch who appears to have lived about the year 1490 before our era, and whom I assume to be the Pharaoh of the Jewish exodus; and we not only admire their forms, but the richness of the materials of which they are made, the colours and the hieroglyphics themselves showing them to have been of gold and silver, or of this last inlaid with the more precious metal. Those of bronze, alabaster, glass, porcelain, and even of ordinary pottery, were also deserving of admiration from the beauty of their shapes, the designs which ornamented them, and the superior quality of the materials; and gold and silver cups were often beautifully engraved and studded with precious stones.



Ancient Egyptian Vases.

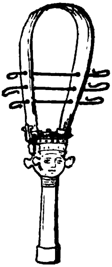
Some vases had one, others two handles; some were ornamented with the heads of wild animals, as the ibex, oryx, or gazelle; others had a head on either side, a fox, a cat, or something similar; and many were ornamented with horses' heads, a whole quadruped, a goose's head, figures of captives, or fancy devices. Bottles, small vases, and pots, used for holding ointment or other purposes connected with the toilet, were of alabaster, glass, porcelain, and hard stone, as granite, basalt, porphyry, serpentine, or breccia; some were of earthenware, ivory, bone, and other materials, according to the choice or means of individuals.' The bronze vessels, and indeed all the bronze manufactures of the Egyptians, are mentioned by Sir Gardner Wilkinson as particularly deserving of attention. He notices especially two vases of this material in the museum (Cases XXXIII-XXXV), the one a vase of elongated form, which belonged to the late Mr Salt, and the excellence of whose manufacture, and particularly the nicety with which the lid fits, prove it to have been the work of a very superior artist: the other a vessel of large dimensions, and shaped like a basin with two handles. Deserving of notice, for another reason, are some of the common earthenware vessels (Cases XXVIII, XXIX), the grotesque faces on which display a taste for the comic (see fig.), for the possession of which, but for such instances of it, we should not be likely to give the Egyptians credit.



Grotesque Vases.

Music was a common part of the entertainment at an Egyptian party; and, as among the Greeks and Romans, there were professional musicians, singers, jugglers, dancers, tumblers, buffoons, &c. whose business it was to attend parties and enliven the guests with their performances. Music, however, was not regarded as a mere amusement by the Egyptians; it was practised as a high art by the priests themselves, and the children of the Egyptians, Strabo says, 'were taught letters, songs appointed by law, and a certain kind of music established by government to the exclusion of every other.' What was the character of the national music of the Egyptians we have hardly any means of knowing; from a remark of Herodotus, however, it is inferred that it was usually sad and plaintive. That historian mentions one very ancient song of theirs named *Maneros*, which had a peculiarly melancholy effect, and was universally known throughout the country. That the Egyptians, although they do not appear to have had any system of musical notation (a discovery which was reserved for the Greek

Terpander about B.C. 670), yet possessed considerable knowledge of music, is evident from the circumstance that both Pythagoras and Plato made the music of the Egyptians a special study. Among their instruments were the harp—which was variously constructed with few or many strings—the lyre, the guitar, the tambourine, the drum, the single and double pipe (the latter a peculiar instrument, used also by the Greeks, consisting of two reeds blown into by a common mouth-piece, and fingered one by each hand, the right having many holes, and serving as a tenor, the left few holes, and emitting a deep bass sound), the flute, the cymbals, the cylindrical maces (consisting of two hollow balls of sonorous metal, with or without a loose ball inside, fastened to handles, and struck together), and lastly, the *sistrum*, an instrument much used in religious ceremonies, consisting of rings of bronze or brass, jingled backwards or forwards on bars or wires by means of a handle fastened into a frame of the same metal on which the wires were strung. Specimens of some of these instruments, including one or two sistra, are to be seen in the museum (Cases XLIV-XLV). Played sometimes alone, sometimes in chorus, and sometimes with vocal accompaniments, they were capable of producing very rich effects. Women were frequently the performers; and blind persons also appear often, as with us, to have devoted themselves to music as a means of earning a livelihood.



Sistrum.

To enumerate all the industrial arts practised among the Egyptians, or to describe all the processes or tools used in the various trades, is of course impossible; it may be remarked generally, however, that as crafts were hereditary in Egypt—every boy being trained, as a matter of custom, in the practice of his father's profession, and allowed to intrude into no other—tradesmen were usually very expert and expeditious. Of the skill of the Egyptian potters, jewellers, and makers of bronze vessels, we have already spoken. In cabinet-work, &c. the Egyptians also excelled, if we may judge from the specimens of their joinery and carving which have survived, of which some are to be seen in the museum (Cases XL, XLI), together with the tools employed in their fabrication (Cases XLII, XLIII). Brick-making, as has already been mentioned, was almost a national occupation among the Egyptians, and in Cases LXI, LXII, there are specimens of bricks with stamps upon them, by which their ages can be identified. As some of them bear the names of Thothmes III. and other Pharaohs of the 18th dynasty, it is possible that these very bricks may have been the work of the Jewish captives, whom, the Mosaic account tells us, the government employed in this service. Not only was the use of glass well known to the Egyptians, but they possessed secrets in the manufacture of this article unknown to the moderns.

In weaving the Egyptians were very proficient, and their linen manufactures especially were celebrated over the whole ancient world. Specimens of linen cloth, taken from mummies, and of the weaving tools used in its manufacture, are to be seen in the museum (Cases XLIV, XLV). The following remarks on Egyptian weaving are from a paper on the subject by Mr Thomson:—'Of the products of the Egyptian loom we know scarcely more than the mummy-pits have disclosed to us; and it would be as unreasonable to look through modern sepulchres for specimens of the state of manufacturing art among ourselves, as to deduce an opinion of the skill of the Egyptians from those fragments of cloth which envelop their dead, and have come down, almost unchanged, to our own time. The curious or costly fabrics which adorned the living, and were the pride of the industry of Thebes, have perished long ago. The great mass of the mummy cloth is of coarse texture, especially that more immediately in contact with the body. The upper bandages near the surface are finer; sometimes the whole is enveloped in a covering coarse and thick, and very like the sacking of the present day; sometimes in cloth coarse and open, like that used in our cheese presses.' Even of the mummy cloths which remain, however, some are remarkable for their fineness, and one is mentioned by Mr Thomson, 'the beauty of whose texture, and the peculiarity of its structure, was very striking. It was close and firm, yet very elastic, and had originally been white. The yarn of both warp and woof was remarkably even and well-spun: the thread of the warp was double, of the woof single, and the warp contained ninety threads in an inch, the woof or weft only forty-four. The fineness, estimated after the manner of cotton yarn, was about thirty hanks in the pound.' The examination of a great many other specimens showed that the disparity in the number of threads between the warp and the woof, remarked in the mummy cloth just mentioned, was universal and characteristic of Egyptian manufacture. The warp generally had twice or thrice, and sometimes four times, as many threads in an inch as the woof. 'This structure,' says Mr Thomson, 'so different from that of modern cloth, which has the proportions nearly equal, originated probably in the difficulty and tediousness of getting in the woof when the shuttle was thrown by hand, which is the practice in India at the present day, and which there are weavers still living old enough to remember as the universal practice in this country.' It would be difficult, without the example before us of the excellence of the native handloom fabrics of India, to conceive how such fine linen as was made in Egypt could have been produced by such rude mechanical means as were there available. Of some of the finer specimens in the museum, Mr Thomson says his first impression was, that they were muslins which had been brought to Egypt from India, so very delicate was their texture. One specimen seems to be made of yarns of about 100 hanks to the pound, and has 140 threads in the warp, and about 64 in the woof; while in the finest known piece of India muslin of the present day, the warp consists of 100 threads, and the woof of 84 threads to the inch. Some of the cloths in the museum are fringed at the ends, and the salvages are in all very carefully formed. There are some also with striped borders: one is particularly noticed by Mr Thomson, which had a very elegant though simple border, consisting of a stripe of blue alternating with three stripes of fawn colour. What the colouring matter in the stripes of fawn is, Mr Thomson could not discover, but the blue he found to be indigo, and the colour was evidently applied to the threads before they were woven: the Egyptians also understood the art of producing coloured patterns by chemical means, or, in technical language, by the use of mordants. 'In Egypt,' says Pliny, 'they stain cloths in a wonderful manner. They take them in their original state, quite white, and imbue them not with a dye, but with certain drugs which have the power of absorbing colour; when this is done, there is still no appearance of change in the cloths, but so soon as they are dipped into a bath of pigment prepared for the purpose, they are taken out properly coloured. The singular thing is, that though the bath contained only one colour, several hues are imparted to the piece, the changes depending on the nature of the drug employed.' This was a very great advance in manufactures, and even in practical chemistry; but it is only one of the many things told of the fine linen of Egypt, specimens of which, embroidered, and interwoven with gold and silver wire, were kept as curiosities in Greek and Roman museums. Until recently, it was supposed that all the cloths found round Egyptian mummies were cotton: the use of the microscope has clearly proved that, without exception, they are linen, the fibres of linen presenting, when strongly magnified, the appearance of hollow cylindrical tubes jointed like a cane, while cotton fibres are flat like a ribbon. Linen, in short, was the only kind of cloth which it was lawful to use for enwrapping dead bodies. There were, however, both cotton and woollen manufactures in Egypt; of the latter material rugs and carpets seem to have been made.

Another species of manufacture for which Egypt was celebrated was that of paper, from the far-famed papyrus-plant, which grew chiefly in the Delta. Like brick-making, the manufacture of papyrus was a government monopoly. The process consisted simply in the pressure together of strips of the inner rind of the plant, previously glued; and the quality of the paper depended partly on the manufacture, partly on the age of the plant, and the part of the stalk from which the strips were taken. Of papyrus, although probably not of the kind used for paper, were also made baskets, mats, sandals, sails, and canoes. 'The ark of bulrushes' on which Moses was exposed was in all likelihood a little cradle or canoe bound together with papyrus.

Of the agriculture of the Egyptians, represented in the museum by a few implements contained in Cases XXXIII-XXXV, we do not know much. The caste of husbandmen do not seem to have been proprietors of the soil which they cultivated, but only life-tenants of the state—that is, of the priests and soldiers. They were doubtless at liberty, however, to adopt their own system as regarded crops, irrigation, &c. The Egyptians were good gardeners, florists, and vine-dressers; and many of the processes connected with these occupations are represented in their paintings. In the paintings of gardens, monkeys are sometimes represented assisting the gardeners in gathering the fruit.

The arms used by the Egyptian soldiers, or members of the military caste, were very various—the bow, usually about five and a-half feet long, with which they were very expert; the spear, the javelin, the sling, a short straight sword, a dagger, a knife, a short curved sword or falchion, an axe or hatchet, a pole-axe, and a mace. Of some of these there are specimens in the museum (Cases XXXVI, XXXVII). Their defensive armour consisted of a quilted cuirass covered with metal plates, a helmet, and a shield. In Cases XXXVI, XXXVII, division 4, there are a helmet and cuirass made of the tough skin of the crocodile. The soldiers were not all similarly armed, but were divided into companies, each trained to the use of one or more weapons, and provided with a peculiar banner or standard.

Among the amusements of the Egyptians, besides many of which no memory has been preserved, were dancing, juggling, tumbling, wrestling, single-stick, ball-throwing and ball-tossing, and other games of strength and skill; hunting, fishing, fowling, bull-baiting, and other sports; the game of draughts, which was at least as old as the reign of Oertesen I., or B.C. 1740, and therefore contemporary with Jacob and Joseph; *mora*, a game also known to the Romans, and still popular in Italy, played by two persons, who throw out each so many fingers of the right hand simultaneously, while the other guesses the sum; dice; thimblerigging, and other games of chance. In the museum (Cases XLIV, XLV) are specimens of Egyptian dice and draughtsmen, also some balls of leather, &c. stuffed. Beside these are some wooden dolls, once the possession doubtless of some prattling little girl in the time of the Pharaohs; and other toys, chiefly models of fruit, eggs, &c. Models of animals, of men working at trades, &c. were favourite toys with Egyptian children, and the most grotesque seem to have pleased the best.

Of the Egyptian religion nothing has yet been said; and although it is the subject which it would be most desirable to understand, seeing that the religion of Egypt pervaded and determined the whole life of the people, regulating their daily actions with the same minuteness that Brahminism regulates those of the Hindoos, yet it is the topic on which it is most difficult to say anything certain or distinct. This arises from the impossibility of transferring ourselves to the point of view of the ancient polytheists, or conceiving the solemn feelings which were attached in their minds to visible forms and ceremonies, which to us, educated under nobler influences, and removed by many centuries from all polytheistic associations, seem, the one mere blocks of stone and wood, the other mere mummeries or juggles. Even those who have learned most to rid themselves of that vulgar and despicable mode of thinking which supposes the religions practised in Egypt, Greece, or Rome, to have been mere systems of imposture devised by the priesthoods of the several countries, are at a loss when they try to penetrate into the meaning and spirit of those religions. Of the morality which they inculcated or tended to produce it is not difficult to judge; regarding the forms of worship also peculiar to each we possess a sufficient amount of information; but of their creeds, of the abstract theological views which were embodied in them, it is difficult to form an idea, and most of all with regard to that of Egypt. There are two theories on this subject. The one supposes that men in their savage state are naturally fetichists—that is, that they attach the feelings of reverence with which all men are endowed to common objects around them—such as stones, trees, animals—worshipping these objects really as gods; that then, as they grow more civilised, they generalise, and transfer their religious feelings to the greater objects or powers of nature, such as the sun, the moon, the wind; that at this stage they begin to personify these objects and powers, supposing animated beings to inhere in them, or lie behind them; that thus arises a system of polytheism such as that which the ancient pagans professed; and that ultimately out of this state the mind, generalising still farther, arrives at the notion of one Supreme Deity. The other theory, and that which is borne out by history, is, that originally in men there existed a true spiritual sense or true monotheistic notions of religion; that polytheism has originated in the efforts of men to symbolise these, and give them external shape by means of visible images, whether natural objects or works of art; that ultimately with the mass of men the symbols came to stand for the realities, and true spiritual notions were lost; but that enlightened and pious polytheists in all ages still retained some sense of the mysteries imbedded in their forms of worship, and invested these forms with deeper meaning than were apparent to the multitude. According to the former theory, the religion of the Egyptians was a fetichism just emerging into polytheism; that is to say, the people were precisely at that stage of culture when, from the implicit worship of natural objects, such as trees, animals, &c. they were rising to the conception of certain great animated powers ruling in the different departments of nature—a power or god, for instance, producing rain; a power residing in the river Nile; and so on. According to the other theory, the Egyptians partook originally of that belief in one God which was common to almost all the Oriental nations; but in order to embody their conceptions of the modes in which this One Spirit manifested himself through nature, they divided him, as it were, into distinct agencies, according to the various classes of phenomena they observed using the name, and ultimately one symbolical form or image, to represent God the rain-producer, another to represent God the fertiliser of Egypt, and so on—which symbols came at length to be accepted literally by the mass of the people. Whichever of the two theories one adopts in general, it is almost certain that the second is the true account of the Egyptian religion, and, upon the whole, we shall understand it best by supposing it to have been essentially like Hindooism, at the foundation of which, gross and bewildering as are its forms, and multitudinous as are its gods, there do indubitably lie certain profound notions of a spiritual nature discernible to reflective minds.

The following are the chief Egyptian deities, with the symbols under which they were represented and worshipped:—1. Neph, the creating intelligence, represented as a man with a ram's head. 2. Ammon or Amen-ra—that is, 'The Hidden' (sometimes identified with Neph), in whom the Greeks recognised their Zeus or Jupiter, the chief of the gods; represented as a man with a head-dress, called a *tesher*, surrounded by feathers. 3. Pthah, the Greek Hephæstos or Vulcan, and the creator of the sun and

Amen-ra.

moon, represented as a mummy with a plain close cap, or as a bandy-legged dwarf, with a scarabæus or beetle on his head. 4. Khem, supposed to be the same as the Greek Pan. 5. Sete—that is, 'The Sun's Beam'—identical with Juno, represented as a female with a cap and two goat's horns on her head. 6. Mout, 'The Mother,' typifying nature, the wife of Neph, a female figure wearing the *pschent*, or royal cap. 7. Pasht, 'The Lioness,' the wife of Phtha, and identical with the Greek Bubastes or Diana; a female form, lion-headed. 8. Neith, or Minerva, a female, crowned, and carrying a crooked staff. 9. Ra, 'The Sun,' the Greek Helios or Sol; a human form with the head of a hawk, on which is the solar disk. 10. Seb, 'Star,' the same as Cronos, or Saturn, a man with a goose on his head. 11. Nutpe, or Netpe, 'Abyss of Heaven,' the wife of Seb, and the Greek Rhea, a woman with a vase on her head. 12. Osiris, the son of Seb and Nutpe, represented in two characters—either as a mummy with a cap, in which character he is called *Omnophris*, 'The Revealer of Good,' and corresponds to Bacchus; or as a man green-coloured, wearing the *atf*, a conical cap with green feathers, in which character he is called *Pethempamentes*, 'The Dweller in Hades,' and corresponds to Pluto. 13. Isis, 'The Seat,' a female with a crown on her head, and sometimes cat-headed, corresponding to Ceres, or Proserpine. 14. Her, or Horus, 'The Path,' the son of Osiris and Isis, represented as a man hawk-headed, and crowned with the pschent, in which character he corresponds to Apollo; or as an infant, with his hand on his mouth (the younger Herus), in which character he corresponds to Harpocrates. 15. Ather, or Venus, a female form sometimes cow-headed, the wife of Horus. 16. Thoth, 'Speech,' Mercury, the inventor of speech, and the god of the moon, a man ibis-headed, or with the crescent moon on his head. 17. Anup, or Anubis, 'The Embalmer of the Dead,' black, with a golden face. 18. Atum-Nefer, 'The Bringer of Good,' a human form, with a lily and two tall plumes on his head. 19. Aneka, Vesta, wearing a crown with a circle of feathers. 20. Hapi-Moou, the Nile, a fat man, of blue colour, with flowers in his hands, and water plants growing round his head. All these deities, and many more, were worshipped, some more peculiarly

Thoth.

Anubis.

in one district, some in another. Osiris and Isis were, according to Herodotus, the only gods worshipped over the whole country. The same historian says that the Greeks derived most of their gods and religious ceremonies from Egypt.

The whole land was literally covered with temples dedicated to the foregoing gods, in honour of each of whom there were periodical festivals, processions, &c., in addition to the daily prayers and sacrifices. The conduct of these ceremonies, together with the practice of divination, and the pursuit of the various professions requiring intellectual cultivation, afforded sufficient occupation to the priests, who appear to have been a studious and sincere body of men, zealous for the prosperity of Egypt, and under whom the people bowed with the most devout submission. The Egyptian priests had only one wife; wealthy Egyptians of other castes were polygamists. One part of the priestly profession was the care of the sacred animals, for in ancient Egypt, as in Hindoostan at the present day, there was a religious veneration for all descriptions of animal life. 'The laws,' says Herodotus, 'compel the Egyptians to cherish animals, and the office of attending them is esteemed honourable. In the presence of these animals the inhabitants perform their vows, addressing themselves to the divinity who is supposed to be represented by the animal in whose presence they are. It is a capital crime to kill any of the sacred animals designedly, and to destroy one accidentally is punished by a fine determined by the priests.' Different animals were sacred in different districts—the cat in one, the cow in another, the crocodile in a third, the eel in a fourth, the ram, bull, jackal, ibex, sow, frog, &c. in others, the hawk and ibis over the greater part of the country. The animals were sometimes worshipped as deities themselves, sometimes as representatives of the special gods to whom they were deemed sacred.

In the museum (Cases I-XI) there is a large collection of images of the gods and sacred animals of Egypt, some made of wood, some of metal, some of stone, some of earthenware. The larger deities, which are of wood, have been discovered chiefly in tombs; the bronze statues appear to have served as household gods; the small porcelain figures were for the most part found attached to the necks of mummies. To examine the entire collection is impossible; some of the figures, however, are worth looking at, particularly a beautiful silver statue of Amen-ra in Case I.

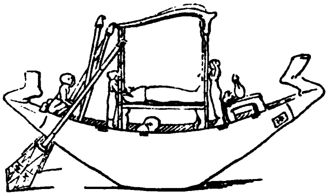
The immortality of the soul was one of the chief tenets of the Egyptian religion, and it was this tenet, accompanied as it was by a belief in the resurrection of the body, that formed the reason of that singular practice of embalming the body after death which distinguished the Egyptians among ancient nations. The best account of their mode of embalming is that given by Herodotus:—'There are certain persons,' he says, 'legally devoted to the profession of embalming (they were members of the medical profession). When a dead body is brought to them, they exhibit to the friends of the deceased different models highly finished in wood, the most perfect representing the most expensive, and the other two inferior modes of embalming; they then inquire after which model the deceased shall be embalmed. When the price is determined, the relations retire, and the embalmers proceed thus:—in the most perfect specimens of their art they draw the brain through the nostrils, partly with a piece of crooked iron, and partly by the infusion of drugs; they then, with an Ethiopian stone (a flint knife), make an incision in the side, through which they extract the intestines; these they cleanse thoroughly, washing them with palm-wine, and afterwards covering them with pounded aromatics; they then fill the body with powder of pure myrrh, cassia, and other perfumes, but not frankincense. Having sewn up the body, it is covered with natron (a kind of soda) for the space of seventy days, which time they may not exceed. At the end of this period it is washed, closely wrapped in bandages of linen previously dipped in gum, and returned to the relations, who enclose it in a case of wood, made to resemble a human figure, and place it upright against the wall in their repository for the dead. The above is the most costly mode of embalming; those who wish to be less expensive adopt the following method:—they neither draw out the intestines, nor make any incision in the dead body, but inject an unguent made from the cedar. After taking proper means to secure the injected oil within the body, it is covered with natron for the time above specified. On the last day they withdraw the liquor before introduced, which brings with it the bowels and intestines: the natron also has eaten away the flesh, and the skin and bones only remain; the body is returned in this state. There is a still cheaper mode of embalming used for the poor.' The tombs in which the mummies were deposited were either deep and extensive excavations in the rock, serving as public catacombs for the poorer classes, or distinct buildings erected on purpose by particular families. So splendid were many of the tombs, that it was said of the Egyptians by foreigners that they bestowed more attention on the sepulchres of the dead than on the domiciles of the living. The Pyramids are now generally admitted to have been erected as tombs for some of their Pharaohs; and for others sepulchres were hewn out of the rock, of incredible extent and beauty. Those of Thebes were the most remarkable.

The utmost care was taken to affix marks to each mummy by which it might be known again. Some families, indeed, kept the mummies of their ancestors in an apartment in their house, each coffin being carved and painted so as to present a likeness of the person it enclosed; and thus, as a modern Englishman of rank, wishing to revive the memory of his forefathers, walks through the portrait-gallery of his mansion, so would an ancient Egyptian, when his thoughts turned to the past, traverse the hall that contained the coffins of his ancestors. The hieroglyphics and other inscriptions on the coffins, some of them elaborately painted and gilt, served to identify such mummies as were buried in the tombs. Sepulchral tablets, in shape somewhat like the small head-stones in our churchyards, and covered with inscriptions and carvings, were also set up over or beside each coffin. There is a large collection of such tablets in the museum, some in the Egyptian Room (Cases LXIII, LXIV, LXXXIV-LXXXVI, XCVII-XCIX), but the greater number down stairs among the sculptures in the Egyptian Saloon. In the public catacombs, where the poorer classes were interred, a mark or two on the side of the rock, close by each coffin, sufficed to preserve the name of the dead. Beside each coffin were usually deposited four vases of arragonite, alabaster, pottery, wood, or any other material, containing the viscera of the dead, if these had been separately embalmed. The first vase, which contained the stomach and larger intestines, had a head shaped like the image of *Amset*, who, according to Egyptian mythology, was the judge or first genius of Hades, and who was represented as a mummy human-headed; the second, containing the smaller intestines, had a head shaped like the baboon-headed image of *Hapi*, the second genius of the dead; the head of the third, containing the lungs and heart, was shaped like the jackal-headed *Siumutf*, the third genius of the dead; and the fourth, containing the liver and gall-bladder, had a head in the shape of *Kebhsnuf*, who was hawk-headed, the fourth genius of the dead. On each vase was inscribed a formula appropriate to it; on the vase Amset a speech, supposed to be addressed to Amset by Isis; on the vase Siumutf a speech, supposed to be addressed to Siumut. by Neith; and so on. Of these sepulchral vases, which, when complete, are always in sets of four, there are numerous specimens in the museum, some in the Bronze Room (Cases XII, XIII, and XX, XXI), and many more among the sculptures in the saloon below. Some coffins, chiefly those of royal personages, were

Mummy-Case.

enclosed in splendid sarcophagi of granite or marble, covered both inside and out with hieroglyphics. By such means the mummies of distinguished persons of Egyptian history could be recognised by their remotest posterity.

Certain curious ceremonies were in use at Egyptian funerals. The mummy in its coffin was always carried to the tomb in a boat employed for the purpose, and called a sepulchral boat. Before it was placed in the boat, and while the funeral guests were assembled on the bank of the river or the lake, any one was at liberty to bring an accusation against the deceased; as, for example, that he had left fraudulent debts. Public notice having been given of the funeral beforehand, the judges of the district were on the spot to try the case; and if the accusation were just, the funeral was forbidden, and the coffin remitted to the house until the heirs of the dead had paid his debts, or otherwise made reparation for his faults. If no accusation were made, speeches were pronounced in praise of the dead, and the body was placed in the boat, and rowed away to the place of sepulture. Models of the funeral-boat, with the rowers, &c. are to be seen in the museum (Bronze Room, Cases X, XI). Another curious law with regard to the dead, enacted, it is believed, about 900 B. C., was, that a person borrowing money was required to give in pledge to the creditor the body of his father or nearest relative—the best possible security, according to Egyptian ideas, as not to redeem such a pledge was reckoned infamous.



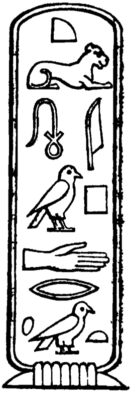
Sepulchral Boat.

Of the many millions of mummies entombed in the soil of Egypt during the long period of twenty centuries which elapsed from the commencement of Egyptian history to the incorporation of the country with the Roman empire, the greater part have yielded to the influence of time, and crumbled into powder. Of the well-embalmed bodies of the rich, however, thousands have been preserved to this day complete and perfect; and as many of these have been carried out of Egypt as curiosities, there is not a museum of consequence in Europe in which there are not to be found the remains of men and women of whom it can be alleged with certainty that three thousand years ago they were walking in the streets of Thebes. In the British Museum alone there are upwards of thirty complete mummies,. besides coffins. They occupy for the most part the cases in the middle of the room. In

Case LXV, division 1, is the mummy of an Egyptian named Pefaakhous Anch-hun-Nefer, who occupied the distinguished post, as his coffin informs us, of auditor of the palace to one of the Pharaohs of the twenty-sixth dynasty (B.C. 530); and who little thought, doubtless, as he trod the royal halls, that one day he should be exposed in a glass case to the view of men, women, and children in that distant island from which he may chance, in virtue of his post, to have heard that the Phœnicians brought their tin. The mummy, although only 5 feet 6¾ inches long, is rather above the average length of Egyptian mummies—a fact from which we are to infer either that the Egyptians were usually of smaller stature than men of the Saxon race, or that the body shrank considerably during the process of embalming. On the wrappages are representations of Osiris, the four genii of the dead, and other gods. Under this mummy is another of a person who was once a priest of Ammon; and in the neighbouring cases are other mummies, some completely bandaged, others partly unwrapped, others in their coffins. The mummy that best exhibits the mode in which the body was swathed is that of Maut-Emmen, a priestess of Ammon, situated near the door (Case LXXVI, division 1); in this the whole form, even to the toes, is perfectly seen. Under it (Case LXXVI, division 3) is a mummy of the Græco-Egyptian period—that of a female named Cleopatra, of the family of Soter, whose coffin lies near (Case LXXVII). On another mummy of the Græco-Egyptian period, apparently that of a Greek youth (Case LXXIV-1), is a portrait of the deceased, painted in rough style on a piece of cedar. One of the most ornamented mummies is that in Case LXVII-1, of Katb-ti, a priestess of Ammon. The head of the mummy of this lady shows a mask of her face gilded; while to the breast, on which is the pectoral plate, are attached wooden models of her arms and hands; on the fingers of the latter are rings and bracelets; and beneath the mummy, beside the coffin, are trays containing the tresses that once adorned her head. Among the most ancient of the relics is an inner coffin (Case LXX-2), supposed to be that of a Pharaoh of the eighth dynasty; and if so, much older than the time of Abraham.

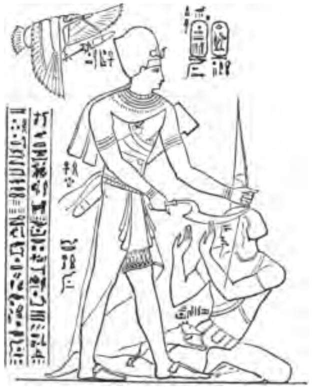
Mummy in its bandages.

It remains still to say something on two important subjects connected with the ancient Egyptians—namely, their literature and their fine arts. Of their spoken language, all that can be decisively said is, that it contained the elements of both of those classes—the Semitic (represented by the Arabic) and the Indo-Germanic (represented by the Sanscrit)—into which the languages of the western world have been divided. Of written languages they had three kinds—the Hieroglyphic, the Hieratic, and the Enchorial or Demotic—the first and the last known to all persons of education, the second chiefly used by the priests. The most ancient of the three, the hieroglyphic, was, in its original form, a mere system of symbols, partly imitative, and partly conventional, to express ideas; thus the figure of a crescent represented the *moon*, the figure of an ape expressed *anger*, the figure of a branch of a tree *victory*, and so on. Whoever had learnt these imitative or conventional symbols, could manage, by painting a few of them on wood or paper, to express his meaning so, that any second person, similarly instructed, could read it; and as the symbols had all a determinate sense, no mistakes could arise. Still, this medium was very imperfect when the meaning to be conveyed was at all complex; hence arose a new form of hieroglyphics, in which the figures, instead of being *symbolic* or representative of ideas, were *phonetic*, or representative of sounds. Thus the figure of a *chisel* was employed to represent not any *thing* or notion of the mind, but simply the sound *ab*; the figure of a *loop* in the same way was used for the sound *men*; and so on; and in this way a reader, converting the figures one by one into the syllables which it had been agreed they were to represent, at once read off the written into the spoken tongue. By a farther simplification of this phonetic plan, certain figures came to stand not for whole syllables, but for single letters; thus an arm for the letter A, an owl for the letter M. When the improvement had gone thus far, the Egyptians were provided with an alphabet, serving the same purpose as our own, although its letters were more picturesque in their shape; and with this alphabet they could express their thoughts in writing as fully and precisely as in speech. The monuments were covered with inscriptions in these phonetic hieroglyphics, which of course would soon, except for some peculiar purposes, supersede the more clumsy symbolic form. The hieratic character was a mere adaptation of the phonetic hieroglyphics for the purposes of writing, the picturesque forms of the letters being curtailed or softened away for the sake of quickness; and the enchorial, or demotic, which, however, did not come into use till about B.C. 500, was a further modification of the hieratic for the purposes of law documents, accounts, &c. In the museum there are hundreds of inscriptions in the hieroglyphic, hieratic, and enchorial characters. Specimens of the first may be seen on the coffins, the mummies, the sepulchral tablets, vases, &c. also on many of the ornaments, tools, and other articles in the room. Of the hieratic and enchorial characters specimens are to be seen in the Bronze Room. There (Cases X, XI, shelf 4) are fragments of religious documents in the hieratic, written on leather and other materials, and also (Cases XXII, XXIII) a number of mercantile receipts, &c. chiefly in enchorial, written on fragments of tile, pottery, &c. and looking for all the world like a number of pieces of broken chimney-pots on which boys have been scribbling. The hieroglyphic seems to have been the character chiefly used in monumental inscriptions; the papyri of the priests, in which was contained the learning for which they were so celebrated, their theology, their astronomy, &c. were probably partly in the hieroglyphic, partly in the hieratic. Some of the implements used in writing, reeds, tablets for holding colours, &c. as well as some inscriptions in hieroglyphic and hieratic, are to be seen in the Egyptian Room (Case XXXIX). As an example of hieroglyphic writing, we give a representation of an inscription from the obelisk of Philæ. The symbols enclosed within the elliptical ring or cartouche signify the word 'Cleopatra'—there being a phonetic character corresponding to every letter in the Greek name, together with the symbols (a small semicircle and oval) of the feminine termination. Thus, beginning at the top, and reading from right to left, we have nine signs respectively agreeing with the nine letters K–L–E–O–P–A–T–R–A—the small oval and semicircle on each side of the last bird, or A, marking the feminine termination.



Of the fine arts of the Egyptians, and especially of that in which they excelled most—their sculpture—we shall have to speak in another part of this volume; all that is necessary here is a word or two on their painting. The painting of the Egyptians was of two kinds, either common painting on a flat surface, such as a board, a wall, a piece of cloth, &c. or painting in connection with sculpture, the figures being at the same time coloured, and cut in relief. Although the former style of painting was in use at a very early period of Egyptian history, no ancient paintings in this style have come down to us; and the genuine specimens of their pictorial art which remain are all of the other style—that is, they are half-sculptures, half-paintings, executed on the walls of tombs, &c. The plan on which they were executed was this:—The wall or other surface to be painted on was first ruled in squares, to insure accurate drawing; then the artist carefully drew the outlines of the figure or figures; when all this was satisfactorily done, the sculptor came and either deepened the figures with his chisel, or cut away the stone between them, according as the painted parts were to be sunken or raised; after this the painter came and put on the colours. From the specimens which remain in this style, we can form an accurate conception of their painting generally; and the first thing that strikes us with regard to it is the absence of all those rules of grouping, perspective, and proportion that are observed by modern artists. All the objects are there, all the limbs of a human figure, for instance, but the proportions are stiff and mechanical; there is no shadowing, but one dead level of colour; one figure is disproportionately gigantic, and another disproportionately small; and the various objects that compose the picture are huddled together with the simple intention, so far as appears, that they should all be equally seen. Yet somehow an effect is produced—the artist's meaning becomes clear, and one sees that he has proceeded on certain conventional rules. The figure of a king, or principal hero of a piece, for instance, is always made large, while the others are made small; the parts of the various figures are all drawn so as each to be complete in itself; perspective is indicated by the objects that are *behind*, the front figures being placed *above* them on the wall; and where one part of an object must be sacrificed, as, for example, where it might be necessary to represent the leg of a king behind the leg of a table, the less important object gives way without any regard to truth of vision—that is, in the case in question the leg of the king is made visible, although it is behind the table. Out of these rules, entirely conventional as they were, and founded partly on custom, partly on metaphysical reason, the Egyptians had constructed a national style of painting peculiar to themselves, and to which they were so attached, that even when they had copies of a better style before them in the paintings of the Greeks, they adhered to it. To an Egyptian, indeed, the best modern painting, with its shadows and perspective, would have seemed unpleasing and unnatural, while a painting in that style, which seems so absurd to us, was at once understood by him, and appealed to his heart. Nor even to modern eyes are Egyptian paintings without merit. Obliged as was the artist, by custom, as well as by positive laws, to adhere to certain rules, with which also his own taste was satisfied, yet even within the circle of these rules genius could show itself, and produce works of excellence.

Egyptian painting, and indeed Egyptian art generally, was at its highest point in the reign of Remeses II., B.C. 1350; the great actions of this Pharaoh affording subjects for art, while his munificence encouraged and sustained it. In the museum are various facsimiles of paintings executed in or near the reign of this monarch; and they are well worth the careful attention of the visitor. In the first place, in the Egyptian Room, on the wall over cases VIII-XXV, are beautifully-executed casts taken from some sculptures on the entrance to a small temple at Beit-oually, near Kalabshe in Upper Egypt, and representing, in two scenes or compartments, the victories of Remeses over the nations of interior Africa. In the first compartment Remeses, in his war-chariot, attended by his two sons, is putting a mass of negroes to rout, driving them single-handed before him into a wood; in the second, Remeses, seated on his throne, is receiving the prince of the Ethiopians with a tribute of elephants' tusks, panthers' skins, gold, gems, chairs, feathers, ostrich-eggs, oxen, a giraffe, green monkeys, lions, gazelles, rare plants, &c. besides negro captives both male and female. Of their kind, both paintings are very effective. On the opposite wall, over Cases XL-LVII, are similar representations from the same temple of the victories of Remeses over the Asiatic nations. They are in five scenes or compartments. In the first, Remeses is on his throne receiving Asiatic captives, who are brought before him by his officers; on the second, he is about to decapitate a wretched Asiatic who kneels at his feet; in the third, he is in his war-chariot driving a flock of Asiatics before him with god-like ease; in the fourth, he is attacking an Asiatic fortress, and dragging out the commander by the hair of the head; and in the fifth, he is again receiving Asiatic prisoners. In all these paintings the Asiatic features are admirably given; and the face, in particular, of the Asiatic captive who is about to be decapitated shows great power. Stepping out of the Egyptian Room into the vestibule, one sees on the wall there several other paintings, the chief of which is a cavo-relievo from a great temple at Karnak, and contains a scene also from the history of Remeses II. Here the monarch, whose proportions are gigantic, is in his war-chariot defeating the Asiatic nation of the Tahennu. His bow-string is round the neck of their chief, whom he is about to decapitate with his falchion, while before him is a crowd of Tahennu, some dead, and the rest flying, but all of them with an arrow deep in some part of the body, sent from the



unerring bow of Remeses. Besides these paintings in the Egyptain Room and vestibule, there are eleven distinct subjects of common life in the Egyptian Saloon below.*

III.—BRONZE ROOM.

The contents of this room, which opens from the Egyptian Room, are of a miscellaneous character. On entering, the visitor finds on the left hand a collection of Egyptian antiquities either supplementary to, or duplicates of, those which he has just left, and consisting chiefly of sepulchral vases, boxes, tablets, parts of coffins, &c. for which accommodation was wanting in the Egyptian Room. As sufficient reference has already been made to these, they need detain us no longer. They fill a range of twenty-seven cases, and the rest of the room is occupied by a promiscuous assemblage of Greek and Roman antiquities.

To take a thorough view of all the antiquities in this room, miscellaneous and minute as they are, or even to include them all in a satisfactory *coup-d'œil*, would be impossible, did not a large proportion of them admit of being classed under one general designation. But as at least half of the articles, and those the most important, are of bronze—a circumstance from which the room derives its name—the visitor is enabled to look less confusedly by regarding the articles not as so many individual antiquities, but as collected specimens of the bronze-casting and bronze manufactures of the ancients. In this point of view they are exceedingly interesting.

Gold, silver, and copper, were the metals earliest used by man. 'Those three metals,' says the historian Robertson, 'are found in their perfect state in the clefts of rocks, in the sides of mountains, or the channels of rivers. They were accordingly first known, and first applied to use. But iron, the most serviceable of all, and to which man is most indebted, is never discovered in its perfect form; its gross and stubborn ore must feel twice the force of fire, and go through two laborious processes, before it becomes fit for use.' Copper, therefore, and not iron, was the metal used for making weapons, utensils, &c. by all nations in that primitive stage of society to which the historian, speaking more particularly of the Mexicans and Peruvians, here refers. At first, copper was used pure, in which condition it is often found; but experience soon revealed the fact, that, by the addition to the copper of a small quantity of other metal, especially tin, it was rendered more serviceable for all common purposes—more fusible, and at the same time harder. The curious fact once known, that, by mixing the two metals, copper and tin, a third metal is produced, harder, denser, and more fusible than either, a little time sufficed to determine in what proportions it was best to mix them for different purposes. For a variety of purposes a mixture of 87 or 88 per cent. of copper to 13 or 12 per cent. of tin was found most suitable; for others the proportion of copper was increased, for others diminished; and for some peculiar purposes the addition of a little silver, lead, or even gold as a third ingredient, was found advantageous. To all these alloys one common name was given—that of Chalkos by the Greeks, and *Aes* by the Latins. These words, as well as the corresponding Hebrew word, are usually translated by the English word *brass;* but the proper translation is *bronze.* Brass, properly so called, which is an alloy of copper and zinc, was not known to the ancients; and wherever, therefore, in the English translation of the Scriptures, or in English translations of classical authors, the word brass occurs, the reader ought to understand that bronze is meant. The 'works in brass,' in which the artists who made the tabernacle under the direction of Moses, and those later artists who assisted in building Solomon's temple, are said, among other things, to have been skilled, were works in bronze: the brazen gates of Thebes were gates of bronze; and when the Roman poet Horace speaks of his books as being a monument 'more enduring than brass,' what he has in his mind is a bronze statue. Every nation at a particular stage of its culture seems to have discovered bronze for itself—Hebrews, Egyptians, Greeks, Mexicans, Peruvians, all alike knew its uses. The greatest difficulty was in procuring the tin: but in the ancient world this was remedied by the trading Phœnicians, who took care to bring into the general market of the Mediterranean nations a sufficient supply from the remote island of Britain.

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* See Sir J. G. Wilkinson's 'Manners and Customs of the Ancient Egyptians;' also the volumes on 'Egyptian Antiquities' in the 'Library of Entertaining Knowledge.'

Even after the use of iron, and the process of smelting it came to be known—which in Egypt and other civilised nations of remote antiquity is supposed to have been about the year B.C. 1400—bronze continued to be preferred for almost all purposes, on account of the greater ease with which it could be worked. The swords and other arms, both offensive and defensive, of the Hebrews, Phœnicians, Assyrians, Egyptians, Greeks, and even of so late a nation as the Romans, were all of bronze, as were their cutting instruments—chisels, saws, knives, &c. their implements of agriculture, their vases, and many other utensils. The use of iron and steel was the exception rather than the rule; the Etruscans, who had their swords of this metal, were singular in the practice. Even for those purposes where steel alone would seem to moderns to be of any use, the ancients made bronze suffice. Like the Peruvians and Mexicans, the Egyptains, the Greeks, &c. seem to have possessed the art, now lost, of tempering bronze so, that chisels of that metal could cut the hardest rock. The hieroglyphics on the granite rocks of Egypt, which are cut with a clearness, and of a depth, that the modern sculptor could not surpass, were all executed with bronze chisels. Even elasticity could be imparted to bronze by the ancients; and in the Berlin museum there is a bronze dagger of such exquisite temper, that it can be bent like a blade of steel.

At first, articles of bronze were made by hammering into the required shape a lump of the metal as it came from the furnace. And for certain purposes, as, for instance, to impart, where it was necessary, the above-mentioned qualities of hardness and elasticity, the process of hammering would doubtless always continue to be used. The most malleable bronze is that which contains from 85 to 90 per cent. of copper. When the article to be made was of large size, as, for instance, a statue, the practice was to hammer the several pieces apart, and then unite them either by means of pins of metal, as was the case with a very ancient bronze statue of Jupiter at Sparta, or by soldering them together. The art of soldering metals was said to have been invented by Glaucus, a Greek of Chios, who lived about six hundred years before Christ; but as the art is one that could scarcely fail to be discovered wherever metallurgy was practised, the tradition probably signified nothing more than that Glaucus introduced it in the Greek part of the world.

As Glaucus of Chios was reported among the Greeks to be the inventor of the art of soldering metals, so the invention of bronze-castings, and metal-casting generally, was attributed by them to Phœcus, Theodorus, and Telecles, three contemporary artists of Samos (B.C. 870), the most celebrated of all the early Greek cities for artistic skill and enterprise. Theodorus especially had a traditional renown among the Greeks for his skill in this art; and one of his works mentioned by Pliny was a bronze cast of himself, holding in his right hand a file, and in his left a model of a chariot and four horses, so minute, that it could be covered with the wings of a fly. Here again, however, we are to understand the report which attributes the invention of bronze-casting to those artists to be simply a Greek tradition having reference to the Greek part of the world. In Phœnicia, Egypt, India, and, in short, wherever metal-working was at all practised, the art of shaping articles of bronze, by pouring the metal in a melted state into a mould, must have been known at a very early period. Once known, it would supersede, except in such peculiar cases as have been noticed, the comparatively difficult and clumsy art of bronze-hammering. Yet the Greek authors, in mentioning statues &c. of bronze, are careful to distinguish those that were hammer-worked from those that were cast; as if, from whim or prejudice, some artists had adhered to the former process.

In the first stage of bronze-casting, the article was cast solid in a mould of clay, or some other suitable substance; but both for convenience and economy, it became customary, when the object was of any considerable dimensions, to cast it hollow by introducing a *core* or *central* nucleus into the mould, and pouring the metal round it. As soon as this practice had come to be known, bronze-casting may be said to have reached its essential perfection; all subsequent changes, whether by ancient or modern sculptors, being mere improvements in detail. The method of bronze-casting, as practised by modern artists, is as follows:—A model of clay, or some composition preferred by the sculptor, having been made somewhat more slender than the cast is intended to be, it is nicely coated over with wax about an inch thick. On this the artist works until he is satisfied that it is a facsimile of the model beneath. The wax is then carefully surrounded by clay, or whatever other substance is used; and the whole being baked, the wax melts, and escaping by holes that are open on purpose, leaves a space between the inner model or core and the outer clay. Into this space the melted metal is introduced by various ducts passing through the outer clay. When it has cooled, the outer clay is taken off, and the inner clay taken out, and the cast stands forth complete, save that it has nodules or spines projecting from it at the points where the ducts ended. These are taken off, and the cast is then perfect. Such is the usual process; but there are many variations on it. One of these, which is in use in the great foundry of Mr Westmacott, where most of the recent colossal works of bronze in this country have been executed, consists in making the *outside* mould first, the material used being a composition of brick-dust and plaster of Paris. The mould is made piece by piece, and the inside of each piece having been coated with the necessary thickness of wax, the pieces are carefully fitted together, and the hollow space or interior is filled with the same mixture as was used for the mould. When this has hardened so as to form a solid core, the outer mould is again removed piece by piece, and the wax is taken off. The mould and the core having then been carefully dried in an oven, the core is fixed, the mould is placed over it piece by piece, and the metal is poured into the space that was occupied by the wax. As it is not deemed of consequence to cast the whole at once, large works are usually cast in parts, and then joined.

Simple as the process appears in description, there is not a more difficult or precarious art than that of bronze-casting. Not to speak of the danger, the chief source of which is the presence of moisture in the mould, causing it to burst when the hot metal descends into it, the chances of failure, even with the utmost precaution, are so great, that the successful execution of any large work in bronze is a triumph. In the curious and romantic autobiography of the extraordinary Italian artist Benvenuto Cellini there is an anecdote illustrative of this. Cellini (A. D. 1543) had undertaken to make for the Grand Duke of Tuscany a bronze cast of his fine group of Perseus and Medusa. The cast was to be of one piece, hollow, and five ells high; and as the duke had expressed doubts of his ability to cast so large a group, Cellini was particularly anxious to succeed. He had at length, after many impediments, brought the work to its last stage; the mould was sunk into a pit dug beneath the furnace; the furnace was heated, and the metal thrown in. It was a drenching day of storm and rain; and at the very moment when all was ready for casting the statue, two cross accidents happened—his shop near took fire, and he became so ill himself as not to be able to stand. Letting the fire burn on, he hastily gave the attendants the necessary directions for pouring in the metal when it should begin to run. 'As for myself,' he said, 'I am extremely ill, and really believe that in a few hours this severe disorder will put an end to my life. Thus I left them in great sorrow, and went to bed. For two hours did I continue in a violent fever, which I every moment perceived to increase. Whilst in this deep affliction, my housekeeper and the rest condoling with me, I perceived a man entering the room as crooked and distorted as the letter S, who began in a tone of voice as dismal and melancholy as those who exhort persons about to be executed, "Alas, poor Benvenuto, your work is spoiled!" No sooner had I heard these words, than I cried out so loud, that my voice might be heard to the skies, and getting out of bed, I began immediately to dress, giving plenty of kicks and cuffs to the maid-servants and the boy as they offered to help me on with my clothes.' Rushing to the furnace, he found the men standing idle round it, and the metal concreted. His first orders were to fetch a load of young oak for firewood from a butcher's over the way. Then as the fire blazed up, he threw in a mass of pewter of about sixty pounds weight to make the metal more clear and fusible. Surprised at his sudden recovery and immense energy, all the men bestirred themselves wonderfully. 'Suddenly a loud noise was heard, and a glittering of fire flashed before our eyes, as if it had been the darting of a thunderbolt. The tremendous noise being over, we began to stare at each other, and perceived that the cover of the furnace had burst and flown off, so that the bronze began to run. I immediately caused the mouths of my mould to be opened, but finding that the metal did not run with its usual velocity, I ordered all my pewter dishes and porringers, which were in number about two hundred, to be placed one by one before my tubes, and part of them to be thrown into the furnace, upon which all present perceived that my bronze was completely dissolved, and that my mould was filling. Then before all I offered up this prayer—"Oh God, I address myself to thee, who, of thy divine power, didst rise from the dead, and ascend in glory to heaven. I acknowledge in gratitude this mercy that my mould has been filled; I fall prostrate before thee, and with my whole heart return thee thanks."' The cast came out completely to his satisfaction.

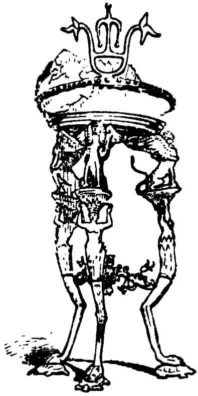
No material seems so much to have been employed among the ancients both for useful and ornamental purposes as bronze. It served them instead both of brass and iron. It was the material which they preferred for statues of their public men, and the number of such statues in all their great cities was almost incredible. Athens, Delphos, and Rhodes, each contained 3000 such statues; and of Rome it used to be said that there were more men of brass in it than Romans. Some of these statues were of colossal size. With the lapse of time they usually acquired a black or blackish-green tint; the latter was much admired, and was sometimes produced artificially. So suitable was the colour of bronze deemed for such works of art, that it was customary to coat statues of cheaper material with a composition that gave them the appearance of bronze—an art still practised under the name of *bronzing*. All the great ancient sculptors worked in bronze as well as marble. Lysippus, the favourite sculptor of Alexander, executed six hundred works in this metal. In later Roman times, when taste had declined, the custom was introduced of gilding bronze statues; and it is told of the Emperor Nero that having once ordered a statue of Alexander to be thus gilt, he caused the gold to be again removed as soon as he had seen the effect. Of this emperor, Tenodorus, a celebrated sculptor of the day, executed a bronze statue 100 feet high. Among the later whims in bronze-casting were also what were called *Polychrom* bronzes—that is, bronzes in which there were various tints besides the natural colour of the metal. Pliny mentions an artist named Austonidas, who, by the use of a little iron with his bronze, made a statue with the cheeks blushing; and Plutarch speaks of another who, by a similar use of silver, represented in a statue the pallid hue of death. Such fancies, however, marked the decline of the art among the ancients. Some great works of bronze were executed in the middle ages, especially in Italy; at present, it is admitted that, more powerful as our mechanical processes for bronze-casting are, we do not excel in the art.

The articles of ancient bronze-manufacture in the museum may be divided into the three classes—weapons and pieces of armour; utensils and miscellaneous objects of ornament; and statues. Among the first, which of course are for the most part of hammer work, an article of some interest is a helmet (Cases XLIV, XLV) found at Olympia, and which was dedicated by Hiero I., king of Syracuse, to Jupiter Olympius on the occasion of a naval victory gained over the Etruscans B.C. 474. This helmet, the gift of that very king who sent a present of corn to the starving people of Rome in the days of Coriolanus, may have been seen by Herodotus.

Among the miscellaneous utensils and articles of ornament made of bronze, are a collection of *fibulæ*, or clasps (Cases LXIX, LXX, and CX, CXII), articles which served the same uses among the Romans as buttons, buckles, &c. do among us; some mirrors, or, as the connoisseurs call them, *specchji* (Cases LXVIII, LXIX, LXXIV, LXXV, LXXVI); vases of various sizes and degrees of finish (Cases LVIII, LXIV); lamps and *thuribula*, or vessels with handles for carrying incense (Cases LVI, LVII); *pateræ*, or shallow saucers used for pouring libations, and receiving the blood of victims, &c. More important objects of this description are the tripods and candelabra contained in Cases XLVI, LIV. The *tripod*—a name applied to any article that stood on three feet—was, on account of its elegance, a favourite form in the furniture of the ancients. It was used for tables, seats, flower-stands, braziers, &c.; and other materials than bronze were often employed in constructing it. Crœsus sent a golden tripod to Thebes in Bœotia, as an offering to the Ismenian Apollo; and an elegant tripod was esteemed a suitable gift to a friend. Among the tripods in Cases XLVI, LI, is one that served as a hearth in some Etruscan family; it has the charcoal still on it, and across it lies the pair of tongs and other utensils that belonged to it. The *candelabra* of the ancients, serving as candlesticks, or lamp-stands, and braziers for incense, were among their most tasteful contrivances. They were of various sizes, from a foot to five or six feet long, and consisted generally of a column led into a triangular base, resting on three feet,

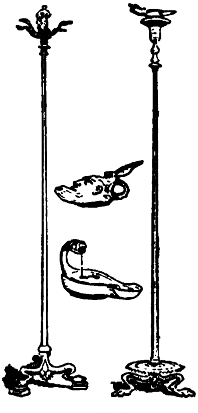
Bronze Mirror.

and surmounted by a broad shallow basin. Some had diverging branches, from which the lamps were hung; and in some, the stalk, which was sometimes a plain cylinder, sometimes a fluted column, and sometimes in the form of a knotted stick, was constructed of several pieces, so that its length could be varied. Some very elegant specimens of Etruscan and Roman candelabra are among those in the museum—scarcely so elegant, however, as that for which an old Roman matron of extravagant tastes is said to have given a sum of 50,000 sesterces, or about £450.



Tripod.

But the most interesting portion of the contents of the Bronze Room are the small statues and busts, chiefly figures of the various deities of the Greek and Roman pantheon. The finest collection of ancient bronzes is said to be at Naples; but even in this single room in the British Museum specimens are to be seen testifying the ability of the ancients in this branch of the fine arts. The larger statues that once adorned the cities of the Greek and Roman world have, with few exceptions, been destroyed—melted down by barbarian avarice during the middle ages; but among such smaller figures as these under notice, spared by various chances, and now collected together (some from Pompeii and Herculaneum), there are pieces of most exquisite workmanship. Passing along the various ranges of miniature deities here assembled (the height varies from an inch to a foot or more), beginning with the Jupiters of Case LXV, and ending with the frolicsome little Cupids of Case LXXXV, the eye selects many individual figures for special admiration. Chief among these are a statue of Mars in Etruscan style (Case LXXI), found in draining the lake of Monte Falterona; three Jupiters found at Paramythia (Case LXXVII); an Apollo, found at the same place (Case LXXVIII), the model of manly grace and beauty; some fine Venuses (Case LXXXIV); and lastly, in the same case, among a number of figures of



Candelabra.

Mercury, one with a small gold collar or *torque* round the neck, reputed to be the most exquisite bronze in Europe. After looking over the cases, the visitor's thought, as he recollects that the little figures he has been admiring were once the Penates or household gods of Greeks and Romans, is—in what sense can intelligent men have worshipped those things? All the figures, however, are not deities; one or two seem to be portraits. Some of these statuettes are of silver, and not of bronze; but these are easily distinguished by their colour.

Cupid.

Among the articles in the Bronze Room that do not come under the designation of bronzes, are spoons, hair pins of ivory, &c. dice, some of which are loaded, crystals, jewels, and specimens of ancient *styli*, or instruments for writing on wax tablets—the sharp end for engraving the characters on the wax, the broad end for making erasures. Various specimens of ancient glass-manufacture are also to be seen in Case C. Until lately, the assertion used to be common that the ancients were not acquainted with glass; and even after the discovery of panes of glass, and glass bottles, in Pompeii, it was maintained that the manufacture was of late origin. There is evidence, however, that glass-blowing was known in Egypt as early as B. C. 1800, and that the use of the article was universal in that country, and afterwards among the Greeks and Romans, if not for window-panes, at least for ornaments, bottles, beads, &c. It is even asserted by Winckelmann that the ancients possessed secrets in glass-manufacture which we have lost—particularly that of making opaque glass with coloured devices penetrating the substance of the glass through and through.

Mercury.

We now proceed to a department as attractive to the mere sight-seer as it is interesting to the archæologist and historian—namely, the 'Etruscan, or Vase Room:'—

IV.—ETRUSCAN, OR VASE ROOM.

There are few parts of the world the history of which we can trace through so long a space of time as Italy. Of Egypt and Palestine we have accounts that extend farther back; and Greece is also, in the eye of the historian, a more ancient theatre of activity; but in none of these countries does the chain of authentic narrative stretch unbroken through so many centuries. From about B. C. 500 to the present time, the historian can follow, almost without interruption, the fortunes of the Italian peninsula. At the former date he sees it as the cradle of the infant power of Rome; a century or two later (B. C. 264), he sees it wholly subdued by that power, and existing as one integral Roman state; still later (A. D. 31—476), he can view it as the seat of an empire that included all the Mediterranean nations; and from this proud epoch he may trace its course downward through the revolutions of the middle age, until it assumes beneath his gaze its present aspect as an aggregate of six or seven insignificant states, overruled by the rest of Europe.

But such a review, extensive as it is, does not include the whole past of Italy. Long anterior to the foundation of Rome, or at least to its existence as a powerful state, Italy was the scene of active and stirring events; and it is towards this period—the pre-Roman period, as it is sometimes called—of Italian history that the industry of ethnographers has of late been particularly directed. According to the most accurate investigations, Italy, between the year B. C. 1000, which is about the remotest point that even conjecture can reach, and the year B. C. 500, when Rome, emerging into notice, draws attention to the whole peninsula, presented pretty much the same aspect as now; that is to say, was subdivided into a variety of states and kingdoms. In the north, inhabiting a great part of what is now called Lombardy, together with the western coast of the peninsula proper as far south as the Tiber, were the Tuscans, Etruscans or Etrurians—a people of uncertain origin, but probably invaders who had come into Central Europe from the East, and thence poured across the Alps in search of a settlement. On the extreme south where the peninsula adjoins Sicily were a number of Grecian colonies, whose hold on the soil they had occupied was so firm, that this district became, as it were, a second Greece, and was called *Magna Græcia* (Great Greece). Between the Etruscans and Greeks, and occupying Central Italy, were a number of aboriginal nations under such names as Umbrians, Latins (of whom the Romans were a branch), Sabines, Samnites, Ausonians, &c. The effect of the gradual growth of Rome was to deprive all these states of their individual independence, and to fuse their separate nationalities into one great commonwealth, extending from the Alps to the Straits of Sicily. But even after the whole peninsula had thus been formed into one united republic, traces of its former condition remained in the differences of dialect, customs, &c. observable in different parts of it. A Roman of the days of Julius Cæsar could enumerate nineteen or twenty distinct portions of the peninsula, and could at once recognise a native of any one of them by certain peculiarities of speech or physiognomy, just as at the present day a sharp Londoner can recognise a native of Yorkshire, Somersetshire, or any other part of England. The differences were especially marked between the natives of the three great ancient divisions of the peninsula—Northern Italy, where the Etruscan habits and features still predominated; Central Italy, where the Latins, Sabines, and other aboriginal nations of Italy lay clustered together; and Magna Græcia, or Southern Italy (part of the present kingdom of Naples), where the Greek race had been so largely infused.

The colonisation of Southern Italy by Greek adventurers from Sicily and Greece Proper being but a portion of the general history of the Greek race, and the condition of the numerous aboriginal nations of Central Italy not being of much consequence, except in connection with the growth of the Latin power, ethnographers and historians, when seeking to ascend through Italian history into the remote ages of the primeval world, have usually directed their attention to Northern Italy, or Etruria. What is known of the ancient Etruscans may be thus summed up:—Settling down (B. C. 1200–1000) as a race of conquerors among the aboriginal populations of that part of Italy, they formed two states on one model—the one called Northern Etruria, north of the Apennines; the other called Southern Etruria, or Etruria Proper, between the Apennines and the Tiber. A third Etruria, formed by the gradual extension of the Etruscan conquests southward, seems to have existed at one time on the southern side of the Tiber and the regions called Campania. In each of these Etruscan settlements the government was administered by twelve capital or sovereign cities, each of which was the centre of government to a definite extent of territory, including the minor towns and villages situated within it. Among the capital cities of Northern Etruria were Verona and Mantua. The twelve sovereign cities of Etruria Proper were *Cære* (now Cervetii), *Tarquinia* (the ruins of which, called Turchina, are about a mile from the town of Corneto), *Vetulonium* (site not exactly known), *Arretium* (now Arezzo), *Perusia* (now Perugia), *Clusium* (now Chiusi), *Rusellæ* (the site of which is now occupied by Moscona), *Veii* (site recently discovered about twelve miles from Rome), *Vulsinii* (now Bolsena), *Volaterræ* (now Volterra), *Cortona* (site doubtful), and *Fesulæ* (now Fiesole). Each of the cities was independent of the others in the government of the territory attached to it; and in each the ruling power was in the hands of a limited number of houses or families, the heads of which officiated both as priests and nobles in the community, and annually elected one of their own number to be chief magistrate, with the name of *Lucumo*. For the conduct of affairs of common interest, however, the twelve cities of Etruria Proper were associated in a league or confederacy; they held certain great religious festivals in common; and in cases of emergency, one of the twelve Lucumos was raised to the dignity of commander-in-chief of all the Etruscan forces. The Etruscans were also bound together by their common interests as a great commercial people. They maintained a trade with all the countries of the Mediterranean; their armed fleets were the terror of the early Greek navigators; and they concluded treaties with the Carthaginians.

In person, the Etruscans were corpulent, of short stature, and with large heads: they are described also as having been gluttonous, sensual, and sumptuous in their tastes. At their banquets the women reclined at table along with the men, a custom which was unusual among the ancient nations, and which marks an advanced condition of society. They were fond of shows, processions, and boisterous games; and the Romans borrowed from them their costumes, badges, religious ceremonies, and official forms. The mythology also of the Etruscans had a powerful effect on the development of the Roman character: a more gloomy and meditative people than the Greeks, their religion was sombre and severe, resembling that of the Oriental nations. They had, indeed, a Pantheon with gods, greater or lesser, corresponding to the deities of the Greeks, but their chief religious notion was an overpowering belief in the subjection of all nature, and even the gods themselves, to certain pre-appointed changes determined by cycles. The duration of the present universe, they believed, was to consist of thirty-eight secular weeks of 8800 years each; one of which weeks was to be the measure of the duration of the earth. This week again consisted of various portions, at the expiry of each of which certain revolutions were to occur. It was the business of men to observe the signs of the times—that is, the storms, comets, earthquakes, &c.—so as to note the exact moment at which these predetermined events were to occur. Hence the art of divination practised by the priest-nobles of Etruria, and according to which all affairs, whether public or private, were regulated. It consisted of three branches—the interpretation of the stars, that of the entrails and the flight of birds, and that of lightning, in which their soothsayers particularly excelled.

That the Etruscans had attained to a remarkable degree of civilisation, is proved by evidence the most indubitable. In hydraulic works, particularly in the art of drainage, they surpassed all the ancient nations. The outlets of the Po into the Adriatic were cut and shaped by them; the rich valley of the Arno, where Florence now stands, was a mere swamp till they drained it; and the tunnels which they constructed for the purpose of drawing off the accumulated water from the craters of extinct volcanoes are said to be still in efficient operation. These works they probably accomplished by the forced labour of serfs, the descendants of the aboriginal tribes whom they had conquered. But a people who could accomplish such works by any means have a claim on our attention, and hence the industry of antiquarians has been directed to the more close elucidation of the habits and manners of the ancient Etruscans, by the examination of such of their architectural remains as have survived to this day. Of these, the most interesting are their tombs or sepulchres.

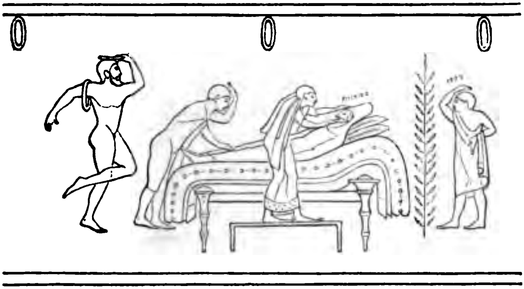
The ancients, it is well known, sometimes burned, and sometimes buried, their dead; but the latter appears to have been the more ancient practice. In either case, the remains were deposited in a tomb, the size and construction of which varied with the rank of the deceased. In some countries, as in Egypt, there were public catacombs or extensive excavations in rock, with separate chambers or receptacles for the dead; in others there were public burying-grounds, in which the dead were deposited in shallow stone graves, only large enough to hold a single body. The rich, however, had tombs of more splendid construction, either vaults dug underground, arched and lined with stone, and otherwise highly ornamented, or actual edifices of stone rising from the ground. The former are called *Hypogœan* tombs by the learned; the latter *Hypergœan*. If the body had been burned, the ashes were gathered into an urn of stone, metal, or *terra-cotta* (the learned word for earthenware); this urn, called a cinerary urn, was deposited in the tomb, either on the floor or in a niche in the wall; and thus, in a family vault might be seen a row of urns containing the ashes of the ancestors of the family for ages back. If the body was interred without being burnt, it was either deposited in a stone or earthenware coffin called a sarcophagus, which was placed on the floor of the tomb, or it was laid on its back, without any coffin, in a recess in the wall, where it was left to decay. For less wealthy persons, the stone lining and stone arching of the narrow grave, which were sometimes loosely thrown together, and sometimes built with cement, served for both sarcophagus and sepulchral chamber. In almost all ancient countries the places of sepulture, whether public or private, were outside the walls of the cities, and usually near one of the great high-roads leading into the country.

The style in which the tombs of the ancients are built, the paintings on the walls of some of them, the inscriptions either on the walls or on separate tablets found in many of them, the cinerary urns in some, and the sarcophagi or coffins in others, are all matters of interest to the archæologist. But that which heightens the interest, and makes the tombs of the ancients in some respects a more valuable source of historic knowledge than even their writings, is the practice that prevailed of depositing in them a variety of rare and valuable articles, quite superfluous, so far as the absolute requirements of the funeral were concerned, but intended as extraordinary marks of respect for the deceased. This practice, though known everywhere, seems to have been more general in very remote times, and among certain nations. The Greeks and Romans followed it sparingly, showing their respect for the dead rather by the splendour and finish of the tombs which they built for them, than by the burial along with them of articles that were of value to the living; hence, with some exceptions, we have derived our specimens of ancient Greek and Roman art from other sources than the tombs. With the Egyptians, on the other hand, as we have seen, the practice of interring articles both common and costly along with the dead was so general, that out of their tombs we have derived articles sufficiently numerous to fill rooms in all the museums of Europe.

In this respect the Etruscans resembled the Egyptians. During the sixteenth, seventeenth, and eighteenth centuries, chance led to the discovery of many ancient Etruscan tombs; and as in almost all of these articles of some value were found, the zeal for discovering such tombs increased, until at length, within the last half century, the work of exploring them has come to be pursued as a profession. In all parts of Italy that were ever occupied by the Etruscans, and especially near the sites of their great ancient cities—Tarquinia, Veii, Volsci, Cœre, Clusium—pieces of land are rented at considerable expense by professional curiosity-dealers, named *Scavi*, who employ men to dig in search of tombs. Some great Italian proprietors, among whom was Lucien Bonaparte, Prince of Canino, have also conducted similar investigations on their Tuscan estates. The consequence is, that already several thousand tombs have been opened, some of them interesting for their architecture, and the paintings, sculptures, and inscriptions on their walls, and all of them containing articles of value—such as sarcophagi, weapons, tripods, sacrificial utensils, candelabra, couches, mirrors, bracelets, rings, earrings, coins, scarabæi, and other gems of exquisite workmanship. The multitude of such articles already disinterred has been so great, as to stock several museums in Italy wholly devoted to Etruscan antiquities—of which the *Museo Gregoriano* at Rome, founded by the late pope, is the chief; as well as to furnish Etruscan departments in other museums both in and out of Italy. Some of the costlier articles have even been converted to modern uses, and the Princess of Canino is said to have once appeared at a ball with a *parure* of jewels taken by her husband from Etruscan tombs. As the excavations still continue, the supply is continually increasing; and in a short time Etruria will rival Egypt in the abundance of its antiquities. Unfortunately, as the excavations have been conducted on no systematic plan, and chiefly by dealers who at once sell what they find, they have not added so much to our knowledge as they might, had care been taken from the first, as is now attempted by the Archæological Society of Rome, to keep together such articles as were found together, or at least to preserve an exact account of the circumstances in which each article was found. There have been numerous cases in which a tomb, when opened, has been found already rifled of its contents, and this not always by a modern hand, for Suetonius informs us that in the days of Julius Cæsar it was customary to explore Etruscan tombs in search of objects of *vertù;* and chance must have led to the opening of many during the middle ages.

The collection of Etruscan antiquities in the British Museum is not so rich as one might expect, nor are the objects arranged in the best order. Instead of being all contained in one room, which could present at a glance the complete materials for a picture of Etruscan life, they are dispersed here and there through the museum on some paltry principle of convenience. Etruscan sarcophagi are to be found down stairs among the sculptures; and smaller Etruscan objects are confusedly mingled with Greek and Roman antiquities in the Bronze Room, where some of the finest weapons, tripods, candelabra, lamps, mirrors, fibulæ, &c. (Cases XLII-XLIII, XLVI-LI, LII-LIII, LXIX-LXX), referred to in the preceding section, are of Etruscan workmanship, and were found in the tombs of Cœre, Vulci, &c. In the so-named Etruscan Room, therefore, the exhibition consists solely of facsimiles of some paintings found in Etruscan tombs, and of a fine collection of those singular objects denominated *Etruscan Vases.* Visitors, we have observed, very rarely stay in this room; merely entering, glancing round, and going out again with the expression in their mouths, ‘Oh, there is nothing here but a lot of painted jugs; let us go to some other room.’ There could not be a greater mistake than this; for although the room would gain in appearance, as well as in real utility, if it were devoted to Etruscan antiquities generally, yet as it is, it contains many objects that would seem both beautiful and interesting, if only the visitor knew what they were.

In the museum there are copies of five sets of Etruscan tomb-paintings, two of which are in the Bronze Room, painted on the walls over the cases, and the other three similarly painted on the walls of the Vase Room. As the two rooms adjoin, the visitor can, without difficulty, examine all the five paintings together. The copies were carefully made from the originals by Signor Campanari, an Italian collector, from whom many of the Etruscan objects in the museum were purchased: the original tomb-paintings themselves, it has been observed, however perfect when discovered, soon fade after their exposure to the air. We shall here enumerate the paintings:—1. Over Cases XXXVI-LV, in the Etruscan Room, are a set of paintings from a tomb at Tarquinia; the lower division represents dances and entertainments after the Etruscan fashion, the upper the Etruscan games of leaping, running, chariot-racing, boxing, throwing the discus, &c.; above is a large vase, and two persons at an entertainment. 2. In the same room, over Cases VI-XXVI, are a set of paintings from the walls of another tomb at Tarquinia, representing in the centre an entertainment, with vessels and attendants, one of whom holds a wine-strainer in his hand, and at the sides male and female dancers, with trees and animals. 3. In the same room, over Cases I-IV and LVII-LIX, are two interesting subjects from a tomb at Corneto, the one representing an old man stretched on a couch or bier, with a female bending over him, and in the act of drawing a hood over his eyes, just closed in death, while a young man at the foot of the couch is reverently covering up the feet of the deceased with one hand, the other being raised to his head in expression of grief. At the head of the couch stands



another man in the attitude of subdued sorrow; but a third male figure is so vehement in the expressions of the same feeling, as to lead to the suspicion that he is one of the hired mourners whom it was customary to employ on such occasions, and who used to rend their garments and strike their bosoms with an air of frantic despair. 4. In the Bronze Room, over Cases VII-XXVI, are paintings from a tomb at Vulci, opened in 1832, representing the games of running, leaping, horse-racing, &c. 5. In the Bronze Room, over cases XXXVIII-LVIII, are paintings from another tomb at Vulci, so mutilated, however, that, with the exception of figures of Pluto and Proserpine near the centre, the subject cannot be made out.

These paintings are but examples out of many. In some of the tombs paintings very different from the above were discovered, representing processions, legendary scenes, mythological subjects, &c. with angels and demons, the former represented as beautiful winged spirits in human shape, the latter as black men with distorted negro countenances; and in some the faces were evidently portraits. The general style of the paintings, although resembling in some points that of the paintings found in the tombs of the Egyptians—as, for instance, in the absence of shadow, and in the conventional usage of certain colours to convey certain meanings—is yet, on the whole, very different. Here, instead of the stiff positions, mechanical drawing, wilful misproportion, and sombre colouring, that were in conformity with the genius of the people of the Nile, we have freedom, warmth, and light fleshy tints, which, conjoined with the nature of most of the subjects, betoken a more joyous temperament and a keener relish for the beautiful in the people among whom they were produced.

How like a mockery of death seems the custom of painting the walls of tombs with such subjects as feasts, flute-playing, and bacchanalian dances; and how strange to think of the thousands of dark vaults yet undiscovered under the soil of Etruria on whose floors lie the dust of Etruscan nobles that lived 2500 years ago, while on the walls all round, waiting only the admission of light to make them visible, are the gaudy colours that were laid on by the brush of the artist at the time when the dead were entombed!

The ceilings of such tombs are usually of painted chequer-work, of red, blue, white, yellow, &c. (see facsimiles on south wall in Bronze Room, and over painting 2 in Etruscan Room); and ribbons of these colours are sometimes painted round the walls. The entrance to the tombs, within the great stone valves that block up the door, is also occasionally ornamented. But that which is most interesting after the paintings, is the inscriptions with which they are frequently accompanied. Specimens of these inscriptions, in the form of detached words or sentences written bent-wise over some of the figures, are to be seen in the paintings in the Bronze Room. It is by the study of such inscriptions that scholars have tried, although hitherto almost in vain, to fathom the mystery of the Etruscan language. It is easy enough to *pronounce* the inscriptions, inasmuch as they are all in a character closely resembling the Greek (and not very different, therefore, from that which we use ourselves), only read from right to left, as was the custom with the most ancient Greeks. But this identity of the Etruscan alphabet with the ancient Greek avails us nothing; for when we pronounce any of the Etruscan inscriptions, the sounds do not bear any resemblance to those of the Greek, Hebrew, Latin, or any other known language, and we are therefore totally in the dark as to what they may mean. Thus in a tomb at Tarquinia called the 'Camera delle Inscrizioni,' or 'Tomb of the Inscriptions,' there are painted in a continuous but bent line forty-six old Greek characters which, when read from right to left, make the following legend: CIVESANAMATUESICALESCE: EURASUCLE·SUAS·PHESTEHI·CHUACHA; but of this formidable array of capitals philologists, with all the lights derived from the knowledge of Greek, Hebrew, &c. have tried in vain to make any sense. In short, the language of the ancient Etruscans remains still a mystery. We know, indeed, the names of some of the Etruscan gods, as Tina for Jupiter, Talna or Kupra for Juno, Turms for Mercury, Aplu for Apollo, and so on; and some Etruscan words have also come down to us either naturalised in Latin, or explained by Latin writers; but all this amounts to little. Ignorant of the Etruscan language, we are consequently ignorant of the origin of the people who spoke it; and though connections have been alleged between them and various nations, as Egyptians, Lydians, Assyrians, Germans, &c. nothing satisfactory has yet been established on the subject. This, and other points, would doubtless have been made clearer had an elaborate work, written on the Etruscans and their history by the Roman emperor, Claudius, been preserved to us.

Among the antiquities almost invariably found in ancient Etruscan tombs when they are opened, those that are most diligently sought after are the PAINTED VASES—that is, vases of baked clay, not left plain, like ordinary vases intended for use, but varnished and ornamented with figures more or less elaborately painted on the surface. Large collections of these objects were made towards the middle and close of last century, and part of the collection now in the British Museum dates from that period, having been made by Sir William Hamilton, who, during his long residence at Naples (1764-1800) in the capacity of English ambassador, distinguished himself as an assiduous purchaser of all such works of ancient art. At that time Etruscan vases brought very high prices; the supply, however, has of late increased so much, in consequence of the more systematic manner in which the business of excavation is conducted, that they have fallen in value. The most extensive collection of ancient painted vases is that of the *Museo Borbonico* at Naples; next to which rank the collections in some other Italian museums. That in the British Museum is, on the whole, very good, and is yearly increasing.

The vases are found sometimes on the floors of the tombs surrounding the spot where the body lay, one or two at the head, others at the feet or between the legs; sometimes suspended from the walls by bronze pegs; and sometimes dashed to pieces close by the wall—the pegs by which they were once fastened having given way. In the commonest graves which Sir William Hamilton saw opened, and which were only of sufficient dimensions to contain the body, five or six painted vases were almost always found; and in the larger tombs have been sometimes discovered as many as sixty vases of different sizes. The large and finer vases are usually found in the better class of tombs, where also the other articles deposited are generally of a more costly description. Finally, it is important to remark that these painted vases are found almost exclusively in tombs. Fragments of them have indeed been discovered in other places; but such spots are supposed to have been the potteries where the vases were manufactured.

As the earliest specimens of such vases were found in Etruria, they were denominated Etruscan Vases—a name which they still retain. The propriety of the name has, however, been questioned; and it is still a controversy among antiquaries whether those painted vases, invariably found as they are in ancient Etruscan tombs, were of native Etruscan, or of Greek manufacture. It is not denied that the Etruscans were capable of making them, for in other matters they displayed skill quite equal to that required for such performances; but many circumstances seem to prove that they were not the makers. In the first place, such painted vases are not confined to Etruria; they are found in equal abundance in Campania; in that part of Southern Italy (now included in the kingdom of Naples) which constituted *Magna Græcia;* also in the island of Sicily; and even, though more rarely, in Greece Proper, and the islands of the Greek archipelago, and everywhere, only in tombs. They have never been found in Asia Minor, notwithstanding that the coasts of that peninsula were completely Greek territories; nor have they ever been found at Rome, or in the specially Roman part of Italy. Setting aside Etruria, the countries in which they have been found most largely are the parts of Italy that were colonised by the Greek race. Either, then, they were of Etruscan origin, and introduced by the Etruscans into the Greek parts of Italy, or they were of Greek origin, and introduced into Etruria by the Greeks. As the Etruscans preceded the Greeks in the mastery of parts of Southern Italy, there could be nothing improbable in the former supposition but for the fact, that the subjects painted on the vases, and the inscriptions on them, are invariably Greek. Now it is not likely that the Etruscans, if they were the makers of the vases, would take their subjects from Greek history and Greek mythology, while it is quite conceivable that, as a tasteful and wealthy people, they would be able to appreciate such objects, and willing to purchase them from their Greek neighbours. And if it had been their custom to bury articles of that description, such as plain native vases, with the dead, to substitute the elegant foreign vases would seem an undoubted improvement. Hence would arise a constant demand among the Etruscans for such Greek ware, which the Greeks, practising the manufacture at the same time for their own purposes, would take care to supply. It is even possible that the Greeks, although the original makers of the painted vases, learned the sepulchral use of them from the Etruscans—a supposition which would account for the fact, that such objects are found only in the Greek countries accessible to Etruscan influence. Used over the whole Greek world as articles of *vertù* and ornament, they are found now, according to this supposition, only in those countries that had learnt from the Etruscans the sepulchral use of them.

But even after the conclusion has been come to, that the painted vases found in the Etruscan tombs are of pure Greek, and not of Etruscan manufacture, the question remains, what was the place of their manufacture—whether within Etruria itself, where they might be made by Greek serfs or settlers, or in Magna Græcia, or finally in Greece Proper? Without detailing all the arguments on the various sides of this question, we may state the most probable conclusion to be as follows:—That the art of painting vases, like the art of making them, may have been practised at various places throughout the Greek countries; but that the majority of the vases, and those that were most prized, came from the famous potteries at Athens in Greece Proper. Long ere this city had risen to eminence in Greece as a political power, the genius of its inhabitants, than whom a more finely-organised people never existed, had begun to display itself in the plastic arts. Having in the neighbourhood of the city a supply of the finest clay, they early attained a high reputation for the excellence of their pottery; and one of the suburbs of the city named *Keramicos*, or 'the potteries,' was wholly devoted to this manufacture. Here, with the help of the simple potter's wheel, a circular revolving board, the use of which was known in the most ancient times, and one or two other implements, as pointed sticks to assist the thumb-nail in scooping out the clay, moulds to stamp figures on it, &c.—vessels, such as jars for wine, drinking goblets, unguent pots, &c. were manufactured of such elegance, that they commanded a higher price over the whole Greek world than the produce of any other pottery. Thus encouraged, the Athenian potters devised new fancies in their ware; new shapes; new colours in the clay; new varnishes. Thinness and lightness was also particularly studied as an excellence in ornamental vases. Finally, some enterprising manufacturer conceived the idea of painting figures on his *lekuthoi*, as the vases were called. At first these figures would be rude enough—mere sketches of animals, heads, &c.; but in progress of time scenes could be painted representing subjects from legendary history or Greek mythology; and after Athens had begun to have painters, their great works would be copied more or less carefully; and the vases on which such copies were painted would serve the same purpose as prints from a modern work of art, and bring correspondingly high prices. Thus at length professional designers and painters were attached to the Athenian potteries, whose business it was to finish one class of the vases before they were brought to market. These artists did not rank high, and were regarded as a mere superior class of mechanics; but there must have been men of great ability and skill among them. Sometimes they inscribed their names on the vases which they made; and on some vases still preserved we read such names as Taleides, Lasimos, Calliphron, &c.

The painted vases, manufactured at the Athenian or other potteries, were applied to various uses. They were used everywhere by the rich as ornaments to rooms, gardens, &c.; they were deposited in temples as gifts to the gods, and then named votive vases; they were carried in religious processions, or used to hold lustral water, consecrated wine, oil, or the blood of a sacrifice. Sometimes they were given as presents to a friend or lover, or to a newly-married couple; and on some vases still remaining, that seem to have been used for this purpose, we read such inscriptions as, 'Η παις Καλη—'The beautiful girl'—a phrase evidently a compliment to the receiver of the gift. At Athens, the oil which it was customary to give as a prize to the winners in the *Panathenæa*, or great games of Athens, was usually contained in a painted vase; and on vases so used we now read the inscription, Των Αθηνηθεν αθλων—'From the games at Athens.' Finally, as we have seen, it was a custom in Etruria, and the Greek parts of Italy and Sicily, to bury such painted vases with the dead; and hence in these countries the demand for vases would be more considerable than in others. What was the meaning of this custom is quite unknown. From the multitude of vases that have been found, with paintings representing subjects connected with the Bacchic or Eleusinian mysteries, it was at one time supposed that they were deposited only in the graves of persons who had been initiated in these mysteries; but this supposition has long been abandoned as untenable. All that can be alleged with certainty is, that the burial by the Etruscans and others of painted vases, and other articles of value with the dead, was a custom founded on some peculiar mode of thinking with respect to the state of existence, and the requirements of the body after death. That articles of food were sometimes deposited with the bodies, is proved by the fact, that eggs have been discovered entire in Etruscan tombs, where they must have lain for nearly 3000 years; and it is possible, therefore, that the vases found in the tomb may at one time have been full of wine, oil, or other liquids. Hardly an instance, however, has been found of any painted vase containing bones or ashes; it is clear, therefore, that these vases are to be distinguished from the common cinerary urns, which, though often of costly material, and fine workmanship, are almost always plain. Finally, whatever was the meaning of the practice of placing painted vases in tombs, it is evident that most of them had been in use before in the household of the deceased. Hence it is that so many vases have been found in the tombs of Italy and Sicily bearing inscriptions which imply that they were given as prizes at the Athenian games, &c. The conclusion, accordingly, is, that the relatives selected a few of the finest vases in their possession (and probably those which had been used for sacred purposes in preference) to be buried, in compliance with some religious prejudice or tenet, along with the body of the deceased. Sometimes even the selection might be made by the dying person himself; or vases might be in the house which had already, for a long time, been set apart for sepulchral uses. Thus on one of the vases in the British Museum there is an interesting inscription in Greek to the following effect: —'My dear Phile, adieu. This vase to be placed in the second sepulchre;' clearly indicating that the proprietor had contemplated the burial of the vase with himself or his wife at death. This vase is divided within into four chambers, two painted white, and two red, emblematic, it is supposed, of the milk and wine they once contained.

Various attempts have been made to classify the Etruscan, or, as they may more properly be termed, Græco-Italian vases; some founded on the supposed place of their manufacture, others on the style of their workmanship, others on their presumed degree of antiquity, and others on the simple circumstance of where they were found. On the supposition that most of the vases, wherever found, were of Athenian manufacture, or at least that the Athenian potteries gave the mode to the other potteries over Greece, it is evident that the best classification would be one which should arrange the vases according to degree of mechanical skill and artistic taste displayed in them; for as, generally speaking, the ruder the vase, the more ancient it must be, this classification would serve the purposes of chronology at the same time. And it has been remarked, as a verification of the hypothesis of the Athenian origin of the majority of the vases, that when arranged chronologically, they exhibit precisely that progress which is known to have taken place in the pictorial and plastic arts at Athens.

On the whole, therefore, the arrangement adopted in the museum is the best, basing, as it does, a chronological classification of the vases on the apparent rudeness or fineness of their make and pattern. Going round the Vase Room from the left hand, the visitor sees first five cases (Cases I-V) full of heavy black ware, looking like basalt rather than pottery. Some of these vases, which are of all sizes, and exceedingly well-formed, have figures on them in bas-relief; but on none of them are there any paintings. In the two cases that follows, however (Cases VI, VII), there is a total change of pattern. The vases here are no longer black, but of a pale yellow colour; and on this are painted, in a brown or dark-red colour, various figures, chiefly of animals, such as lions, rams, stags, cocks, sphinxes, &c. with ornamental and fantastic flower-borders. The vases are usually of a bulky shape; and the figures seem added, not on their own account as paintings, but simply to ornament the vase. The colours are somewhat clumsily laid on, but the drawing is often very spirited. Some of the vases have inscriptions in the old Greek character. In the range of vases that follow (Cases VIII-XIX) we at once perceive a more advanced style both in the form and the painting. The vases, which are of all sizes, from the largest Panathenæic (about three feet high), of which there is a fine specimen near the middle of the range, to the smallest coffee-pot dimensions, are of the most elegant proportions; some with, and some without handles. The natural colour of the clay is of a deep red or orange, and on this the figures are painted in black. The subjects are no longer mere shapes, or even groups of animals, but mythological legends, such as the stories of Hercules, &c. or scenes from ordinary life. The colouring is still rude; and the male human figures, which are usually in profile, and without much expression, are represented with large, thick, disproportioned limbs, and in violent attitudes, as if it had been the aim

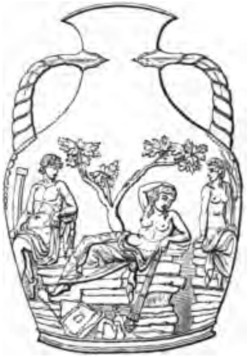
of the painter to give the idea of great muscular strength. In the female figures the eyes are long, and almond-shaped, while in the male they are full and round. Figures of horses, where they occur, are finely drawn; and altogether in this class of vases there is displayed real artistic conception. Finer still, however, are those in the eleven succeeding cases (Cases XX-XXX), in which we see the art of vase-painting carried to its perfection. The vases here are painted black, while the figures are left of the natural red colour of the clay; sometimes other tints, especially white, are added. The figures are often beautifully drawn, and more frequently in attitudes of repose, or gentle movement, than in the preceding class of vases. The subjects remain the same, except that Bacchic dances, and figures of fauns, satyrs, &c. are more common. In the remaining cases (Cases XXXI-LV) we see the same beautiful style continued, except that in the inferior execution of some of the vases the superfluous richness, the selection of effeminate and mystic subjects, and other such characteristics, there is evidence that, at the period over which the manufacture of these vases extended, the art was in its decline. Some of the specimens in this range, however, are exceedingly beautiful. The vases painted on both sides, and contained in the cases that stand in the middle of the room, belong either to this or to the preceding class; and on them, as on the others, the classical visitor, who has leisure to examine the collection minutely, will discover graceful representations not only of the wiles of Bacchus, but also of many legends with which he must be familiar—particularly those relating to the exploits of Hercules, the early heroes of Attic history, and of the chief personages of the Homeric poems.

As regards the dates to which the five different styles of vase-manufacture that have been enumerated are respectively to be assigned, it is hardly possible to speak with precision. Probably, however, the plain black vases of the first style are those which were made by the Etruscans themselves prior to the introduction among them of the produce of the Greek potteries; and this supposition is rendered the more likely by the fact, that vases of this description have been found chiefly at Cære (Cervetri), which is believed to have been the most ancient of the Etruscan cities. In this case these would be the *Etruscan* vases, properly so called, and their probable date B.C. 1000–600. The second class of vases, again—those with the red figures of animals on a pale yellow ground—are probably specimens of the early Greek pottery that was imported into Etruria and Magna Græcia from B.C. 600 to B.C. 500. These vases are found chiefly at Vulci in Etruria, and at Nola in Campania; in their pattern they resemble the Egyptian vases, showing that the Greeks, among their other debts to the Egyptians, owed them their first lessons in the art of vase-making. Vases of this description are sometimes styled *Phœnician* or *Nolan-Egyptian*, but they are all manifestly of Greek manufacture. The remaining classes of vases are to be regarded as exhibiting the successive stages through which native Greek taste passed in improving on the Egyptian pattern that had at first been adopted. Specimens belonging to these classes are found in great plenty both in Etruria and Magna Græcia, and the period of their manufacture probably extended from B.C. 500 to B.C. 150. The most elegant seem to have been made in the age of Philip of Macedon and his son Alexander the Great (B.C. 360–330); and gradually declining from this date, the art of vase-painting appears to have become extinct about the time that the Romans, having extended their supremacy over Italy, began to mediate the conquest of the neighbouring Greek countries. In all probability, indeed, this progress of the Roman power was the cause of the decline of the art. The importation of vases into Italy at least seems to have ceased from the time that the Romans were masters of the peninsula.

A few particulars may here be added regarding the process of ancient vase-making, so far as modern conjecture can explain it. By analysing the earth employed in making some of the finer sorts, chemists have found it to consist of 53 per cent. of silica, 15 per cent. of alumina, 8 per cent. of lime, and 24 per cent. of oxide of iron; the last-named ingredient being that which causes the red colour of the ware. Different shades of colour in the clay—as cream-colour, black, &c.—were produced by employing other ingredients along with the above. Regarding the manner in which the figures were drawn and painted on the vases there have been various theories, of which the most probable has been stated as follows:—'When the vase was made and dried, but probably before it underwent the action of fire, some instrument, rather hard, and capable of containing a portion of black liquid pigment of a certain consistency, was employed by the artist in drawing the outline of the figures and composition. The reason for supposing that the instrument was pointed and hard, and the pigment rather thick, is, that upon a careful examination of some vases, a sort of *sulcus*, or furrow, is observable in the line made by the pressure of the instrument, and which the thickness of the pigment did not fill up; or perhaps the vase itself was so porous as to absorb the moisture of the paint almost immediately. The artist probably then with a brush laid on a coat of the black close to the outline of a certain width, and some inferior person filled up the other parts. The reason for supposing that this plan was pursued, is, that upon accurately examining the vases, there is almost always observed to be a thicker coat of the black paint close to the outline from one-eighth to one-fourth of an inch wide, showing that here the black had been twice laid over. After this the vases were done over probably with a varnish of a reddish tint, not highly polished, and then baked.' Such appears to have been the process usually followed in making the later vases, where the figures are red on a black ground; but there must have been many variations in it. On almost all the vases, it is remarked that the execution is inferior to the conception: when they are painted on both sides, one side, probably that which was least seen, is often carelessly done; and sometimes the drawing on both sides is very bad, as if the artist had not been able correctly to copy the design before him. Indeed, as a whole, the designs have a finer appearance in our modern engravings from the vases than they have on the vases themselves, the modern artist having in such cases filled up and finished what was incomplete in the original. On many of the vases, however, both the conception and the execution are beautiful; all of them are interesting both as representations of ancient customs and as specimens of the progress that the Greeks had attained in the art of design; and if, as is strongly surmised, the compositions on many are but copies roughly executed at the pottery from the works of the great popular paintings of the day, this would incalculably increase their value. If, as Sir William Hamilton remarks, all the paintings of Raffael were lost, what would we not give for such drawings of them as are to be found on the so-called Urbino vases?

All the vases in the Etruscan Room are from Italy; and if the visitor would see some of those which have been found in Greece Proper, he must return to the Bronze Room, where (Cases XXIX-XXXVI) is a collection of vases, both plain and painted, chiefly from Attica and the islands of the Ægean. In Cases XXXV, XXXVI, there are some painted vases which are probably contemporaneous with the age of Pericles (B.C. 430), when Athenian art was at its climax. These are well worth inspection, particularly that marked No. 2847, in which is a representation in blue, crimson, purple, and green, of Electra and her attendants at the tomb of Agamemnon. The vases in Cases XXXI-XXXIV are more ancient; the most remarkable among them are a small pyxis, or unguent box (No. 2923, Cases XXXIII, XXXIV), in shape like a butter-dish, decorated with Cupids and other figures in white, blue, and red, on a black ground, and an exquisite little œnochöe, or wine-jug of a black colour, with the figure of a little boy in white creeping to a low stool on which is an apple. In this range of cases (Cases XXIX, XXX) are also to be seen specimens of the coarser vessels used by the Greeks for common purposes, as for holding wine, &c.; as also of the cinerary urns—one of earthenware, in Cases XXXIII, XXXIV, from a sepulchre near Athens; and another of the same material, but of a remarkable shape, painted white, in Cases XXXV, XXXVI, shelf 3, both containing human bones. In Cases XXXVIII-XLI are five leaden vases from the island of Delos, also full of human bones.

A few years ago, one of the objects of greatest attraction in the museum was a particular cinerary urn known by the name of the Portland or Barberini vase. It used to stand under a glass cover on an octagonal table in one of the small rooms, and visitors used to gather round it admiringly. This vase was not of clay, like the Etruscan and the majority of the Greek vases, but of a dark-blue glass, the figures and devices being raised on this in white enamel. The height of the whole was ten inches; at the open top the diameter was three and a-half inches; at the narrowest part of the neck it was two inches; and under this there bulged out the body of the vase, the diameter of which, at the broadest part, was seven, and at the bottom five inches. There were two handles, one on each side. The contrast of the white figures with the deep blue ground produced a most beautiful effect, which the singular elegance of the form greatly enhanced. The figures were seven in number—three men, three women, and a Cupid, or winged boy, arranged as follows:—'Near one of the handles a male figure standing under a kind of porch, and offering his extended arm to a female seated on the ground, over whose head bends the branch of a tree: a winged boy is hovering over these two figures; and to the right is a man leaning his elbow, in an easy attitude, on his knee, the foot being raised on a stone, and his chin resting on his hand. We then come to the second handle, near which is a man seated on a stone, and looking at a female figure reclining in an easy and elegant attitude, with an inverted torch in her left hand, and the right passing over her head; the branch of a tree bends over her; and at her left hand is another male figure looking towards her, and holding a staff in his left hand. These figures are about five inches in height, and are modelled or moulded with minute



accuracy. Being different in colour and in opacity from the glass on which they are laid, they must have been fashioned before being fixed on the vase; yet the union has been so complete, that no joint can be seen between them; and the minute details of the figures have not been in the slightest degree injured by the heat which in all probability was necessary in the process of cementation. At the bottom of the vase is an enamelled head and bust, and under each handle is a small, wild-looking head, with long hair and beard.' As to the precise import of the figures and devices there have been various opinions, none of which is perfectly satisfactory.

This beautiful product of Greek art was discovered about the middle of the sixteenth century in a marble sarcophagus in a sepulchre at a place called *Monte del Grano*, about two miles and a-half from Rome. The sepulchre was believed to be that of the Roman emperor, Alexander Severus (A. D. 223–235), and his mother Mammæa; hence the vase is supposed to have been the cinerary urn of one or other of these royal personages. One of the theories, indeed, with respect to the meaning of the enamelled figures is, that they represented some scene or scenes in the life of Severus. Being greatly admired, the vase was deposited, immediately after its discovery, in the palace of the Barberini family at Rome, where it remained till 1770. It was purchased in that year by Sir William Hamilton, from whose possession it passed into that of the late Duchess of Portland. In 1810 the Duke of Portland, one of the trustees of the museum, allowed it to be placed in that institution, retaining, however, his right over it as his own property. For upwards of thirty years, accordingly, it was to be seen by visitors of the museum. But on the afternoon of the 7th of February 1845, a miscreant named William Lloyd, described as 'a tall young man of delicate appearance, and about twenty years of age,' destroyed this beautiful relic of antiquity by dashing it to pieces with a stone. In the course of two months, during which he had been living idle about London, he had visited the museum several times before, so that he must have formed some idea of the value of the relic; nor could any motive be assigned for his act except an insane love of mischief, or a diseased ambition for notoriety. He was apprehended on the spot; but, owing to the defective state of the law then applicable to such offences, only a slight punishment could be inflicted. A bill, however, was immediately passed through parliament providing specially for future cases of the same kind; and at present, any person who should maliciously injure or destroy any article, whether of intrinsic value or not, deposited in any public museum, cabinet, or gallery, would be liable to an imprisonment of two years, and to one, two, or three public or private whippings. This, it is hoped, will effectually prevent the perpetration of such offences.

The pieces of the fractured vase having been carefully gathered up, were afterwards united in a very complete manner; and thus repaired, it still exists in the museum, a monument at once of exquisite Greek genius and of skilful modern handiwork. It is not now shown, however, to the public, nor is it entered in the catalogue. A small number of copies of the Portland vase were made many years ago by the celebrated Mr Wedgewood; they were exact and admirable likenesses of the original, and were sold at twenty-five guineas each. The moulds used for these copies still exist, but the difficulty of producing each copy is so great, as to prevent their multiplication.*

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* On the subject of ancient vases, their uses, &c. see Mrs Hamilton Gray's 'Tour to the Sepulchres of Etruria;' also the large and finely illustrated works of Sir William Hamilton, Millingen, &c.; Dubois' Maissonneuve; 'Introduction à l'Etude de Vases Antiques;' Smith's 'Dictionary of Classical Antiquities;' Moses's Collection of Antique Vases, &c. from Various Museums; and Dennis's 'Cities and Sepulchres of Etruria.'

NATURAL HISTORY DEPARTMENT.

Under the general and not very accurate name of Natural History is usually comprehended the following group of sciences: 1. *Mineralogy*, whose object it is to describe and classify the individual mineral substances of the globe. 2. *Hydrology*, which takes cognisance of the various modes in which water is distributed over the earth—as in oceans, seas, rivers, floods, springs, cataracts, &c. 3. *Geology*, which concerns itself with the solid crust of the earth, so far as it has been yet penetrated, describing the arrangement of the various mineral masses that compose it, and attempting to account for that arrangement. 4. *Meteorology*, whose business is with the atmosphere that surrounds the globe, and the various phenomena therein presented—such as rain, snow, wind, thunder, &c. 5. *Botany*, which describes and classifies the innumerable vegetable productions with which the earth is clothed; and, 9, *Zoology*, which considers and arranges the manifold forms of animated nature with which the earth, the air, and the sea are peopled. These sciences merge into each other at various points; but it is useful to regard them as distinct, just as it is useful to regard the general science of Natural History to which they all belong as distinct from the two great sciences of Chemistry and Mechanical Philosophy, with which, in the general programme of human knowledge, it stands associated.

Of the six sciences enumerated in the Natural History group, it is obvious that some, from their very nature, cannot be represented in a museum. Such are hydrology and meteorology, it being impossible to assemble in a room, or other limited space, either the rivers, oceans, or cataracts with which the one, or the thunders, hailstones, and lightnings with which the other, is concerned. As regards mineralogy, botany, and zoology, the case is entirely different. Specimens of all, or at least of a large proportion of the individual minerals, plants, and animals found in or upon the globe, may, if the necessary pains is taken, be collected at any one spot, and exhibited there to the curious. Nor, even with regard to geology, is such a method totally impossible. It is true that, in order to convey artificially an idea of the arrangement of the great mineral masses composing the crust of the earth, we must rely chiefly on the aids available also in hydrology and meteorology—that is, on verbal description, accompanied by pictures, engravings, or models; but there is one branch of geology, and that perhaps the most interesting, which it is possible to illustrate by the more decisive method of actually presenting to the eye the objects spoken about. This branch of geology is that named *Palæontology* (from three Greek words—*palaios*, old; *on*, existence or substance; and *logos*, discourse), the object of which is to collect and arrange the organic remains—that is, the relics of ancient plants and animals—found imbedded in a fossil or petrified condition at various depths in the earth's crust. Such fossils, being limited in size, may be detached from the rocks in which they were found, and arranged in apartments devoted to the purpose, where, by their simple inspection, the student may learn much relative to the vegetation with which our planet was covered, and the animal life with which it teemed, in the primitive ages of its history; or by connecting them in his imagination with the verbal descriptions, &c. used in other branches of geology, he may represent to himself the series of changes through which the planet must have passed before its materials assumed their present state of arrangement.

In the British Museum, accordingly, there are included in the Natural History Department collections of four distinct classes of objects—one of minerals, forming a *Mineralogical* section; one of preserved plants, seeds, &c. forming a *Botanical* section; one of preserved animals, forming a *Zoological* section; and one of fossils, or organic remains, constituting a section illustrative of that branch of geology named *Palæontology*. Fossils, however, being but minerals of a peculiar description, the mineralogical and palæontological sections of the museum are not kept apart, but are placed in one continuous gallery under the management of one principal keeper, called the Keeper of the Minerals and Fossils. As regards the arrangements of the museum, this is quite proper; but for the purposes of the present description, it will be best to treat the fossils by themselves, giving them the last place in the Natural History Department. For as fossils partake of the qualities both of organic and inorganic nature, being either mineralised vegetable, or mineralised animal forms, they can be looked at intelligently only by one who has acquired beforehand some notions of botany and zoology. In describing the Natural History Department of the museum, we shall therefore speak, 1*st*, Of the minerals; 2*d*, Of the plants and botanical specimens; 3*d*, Of the zoological specimens; and, 4*th*, Of the fossils:—

I.—MINERALOGICAL SECTION.

This section occupies a portion of a suite of apartments in the north wing of the museum, called the *North Gallery*. The remainder of the same gallery is devoted to the fossils. In no part of the museum are the objects more beautifully arranged or better labelled;* and a patient visitor would be able to pick up much interesting information relating to various important minerals by simply going over the cases and reading the labels. It would assist him much, however, to have some notion of the scope of mineralogical science beforehand, and some notion, especially, of the peculiar and somewhat intricate system of classifying minerals that has been adopted in the museum.

Mineralogy is a very recent science. The ancients, although they possessed considerable knowledge of mining, the art of cutting and setting stones, &c. never attempted any scientific classification of the mineral substances they were acquainted with, or any elaborate investigation of their properties. Pliny, for example, who had more knowledge of natural history than perhaps any of the ancients, could repeat such nonsense about the diamond as this—that it was so hard, that, if it were struck with a hammer on an anvil, it would rather split both hammer and anvil than break itself, unless, indeed, it were first dipped in the blood of a goat recently killed, in which case it would prove soft enough. It is only since the middle of last century that mineralogy has assumed any importance as a branch of natural history. Founded, or at least first put into any systematic shape, by Wallerius, a professor at Upsal, about 1770, it has since occupied the attention of such men as Brunner, Cronstedt, Werner, Haussmann, Haüy, Karsten, Brogniart, Cleveland, Phillips, Jameson, Berzelius, Mohs, Dana, &c. by whose labours it has been brought to a high degree of perfection. As there is no science the materials of which are everywhere so plentiful and accessible—the very dust on which we walk being mineral substance of greater or less value in the eye of the mineralogist—there is perhaps no science that can reckon so many voluntary devotees.

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* It is not creditable that in a national collection like the British Museum so little is done to facilitate the acquisition of knowledge by the unlearned visitors. Why, instead of the meagre and dry labels attached to most of the objects (to some there are none at all), are there not brief descriptions, conveying in plain, brisk language, such interesting tit-bits of information as would find favour with the many? Why, for example, instead of such an inscription as 'Sepulchral Scarabæi,' placed over a case of odd-looking things in the Egyptian Room, as if to frighten people away, is there not a good vigorous label telling what a *scarabæus* is, how it was used, &c.? Again, why should there not be public expositors to perambulate the rooms, and afford the necessary explanations to visitors; to say nothing of popular lecturers of a higher class who might be attached to the museum?

Different mineralogists have adopted different modes of classifying the apparently innumerable varieties of mineral substance composing the earth's crust. Proceeding on certain obvious distinctions, that even at the first glance separate certain classes of minerals from others, the early mineralogists, such as Brunner, Cronstedt, Werner, and Karsten, arranged all mineral substances under four heads:—namely, 1. Earths, or earthy minerals—as marble, slate, sandstone, and such-like; 2. Salts or saline minerals—as common salt, alum, saltpetre, and other saline substances; 3. Bituminous or combustible minerals—as coal, amber, pitch, &c.; and 4. Metals—as gold, silver, iron, &c. Of this classification, which, though rough, is very serviceable, there have been various modifications. One of the most common is that which, subdividing the earths into three classes, gives the following arrangement:—1. Calcareous substances, to which belong marble, chalk, coral, gypsum, and all minerals containing lime; 2. Siliceous substances—as quartz, flint, granite, sandstone, and all minerals into whose composition silex enters; 3. Argillaceous substances, including all kinds of clay, and minerals of clayey composition—as slate, ochre, &c.; 4. Saline substances; 5. Bituminous substances; and 6. Metals. Haüy, Phillips, and other later mineralogists, have adopted systems of arrangement still more complex: Phillips, for example, has the following list of classes—earthy minerals, alkaline-earthy minerals, acids, acidiferous earthy minerals, acidiferous alkaline minerals, native metals, metalliferous minerals, and combustible minerals.

Whichsoever of these systems of arrangement was adopted, the method of procedure with respect to any individual mineral that the collector wished to put in its proper place in his cabinet was very nearly the same. Suppose, for example, that a new mineral came into the hands of a collector whose cabinet was arranged on the Wernerian system of a division into four great classes: a mere glance at the mineral might be sufficient to indicate in which *class* it was to be ranked—whether it was to be placed among the earthy minerals, the saline minerals, the inflammable minerals, or the metals; but in order to discover which *genus* of that class it should be referred to, whether, for example, a particular earthy-mineral was siliceous, or argillaceous, or calcareous, or magnesian, a closer examination would often be necessary; and farther, to distinguish the *species* and the *variety*, the examination would require to be closer still. Now, in conducting this examination so as ultimately to give the mineral its exact place among its fellows in the cabinet, there were a certain set of characters to which the mineralogist particularly attended. The characters of chief importance were these:—*Aspect*, or kind of lustre—as, for example, metallic or non-metallic lustre; *colour; hardness*, of which there was a regular mineralogical scale of degrees, from a substance so soft, as to yield to the thumb-nail to one so hard as to cut glass; *specific gravity*, or the weight of a portion of the mineral, as compared with the weight of an equal bulk of water; *streak*, or the colour of the powder left by the mineral when drawn across a file; *form*, to express the varieties of which various terms are employed, each with a definite signification—as crystalline, massive, stalactitic, globular, nodular, &c. and if crystalline, the form of crystal was stated; *structure*, or internal arrangement of particles —as Camellar, fibrous, granular, &c.; *cleavage*, or the direction in which the mineral could be split up, and the degree of force required to split it; *surface*, or *feel*—as rough, smooth, greasy, &c.; *tenacity*, the variable degrees of which were expressed by such adjectives as brittle, fissile, sectile, &c.; and finally, degree of *transparency*, whether opaque, translucent in small parts, translucent in the mass, or transparent. Characters of minor importance were also occasionally taken into account, such as—Degree of lustre, whether glimmering, glistening, or splendescent; fracture, or the nature of the surface of the parts when broken; frangibility; form of the fragments; odour; taste; sound or ring when struck, &c.

It was by a careful examination of a mineral in all those particulars that a mineralogist of the old school was enabled to assign it its true place in his cabinet; minerals which agreed with each other in the greatest number of particulars being placed together as minerals of the same species. In describing or cataloguing a new mineral also, the method was for the discoverer to mention in a certain order, and in certain established forms of phraseology, the characters which it presented. Such a description, when read by a mineralogist at a distance, instantly conveyed to his mind an idea of the mineral in question; and if he ever afterwards met with it, a reference to the description enabled him to recognise it. Thus the *Thomsonite*, a new mineral discovered by Dr Thomson of Glasgow, would make its *début* in mineralogical books under such a designation as the following:—'*Thomsonite*; a mineral occurring generally in masses; found at Kilpatrick near Dumbarton in Scotland in trap, associated with analcime and prehnite; structure fibrous and radiated, the fibres prolonged into small columnar crystals in the occasional cavities; primary form a right rhombic prism; cleavage, parallel to the diagonal planes of the primary form; fracture, uneven; hardness, scratches fluor spar; colourless; translucent, and in small fragments transparent; lustre, vitreous; tenacity, brittle; specific gravity, 2·35 to 2·37.'

It was a great step in advance, however, when, in addition to the careful noting of such mere external characters and physical properties as form, structure, colour, lustre, cleavage, feel, specific gravity, &c. mineralogists began to subject minerals to chemical analysis with a view to ascertain distinctly what they were in each case composed of. This improvement, which was only possible after chemistry itself had begun to assume precision and importance as a science, dates from the early part of the present century. Since that time, mineralogists have usually appended to their descriptions of the mere physical characteristics of minerals an account of the effects produced on them by acids, or by heat applied either directly or by means of the blowpipe, as well as an exact analysis of their composition. Thus, to the foregoing description of the Thomsonite there would be appended such clauses as the following:—'Before the blowpipe it intumesces, and becomes opaque, but does not fuse; at a red heat it loses water: Analysis—Silica, 38·30; alumina, 30·20; lime, 13·54; soda, 4·53; magnesia, 0·40; water, 30·10.' Such an addition was of great importance in the discrimination of the mineral; and mineralogists who adopted this *mixed* system of classification, as it is called—that is, who took into account the chemical properties of minerals as well as their physical characteristics—would succeed in making a more exact arrangement of the various minerals of the globe than had been attained by mineralogists of the old school. Accordingly, Haüy, Phillips, Jameson, and Mohs, have all followed a mixed system; and on this system many of the mineralogical collections of Europe are still arranged.

But about the year 1815 the great Swedish chemist Berzelius proposed a completely new system of mineralogy, which has since gained ground, and of which, as it is not only beautiful in itself, but is also the system employed in the British Museum, it is necessary here to give some account. The peculiarity of the system, as compared with those that preceded it, is, that it is founded entirely on the consideration of the chemical composition of the minerals, any description of the external characters of a mineral which is given being merely for the purpose of identifying it to the eye or hand of the mineralogist.

Mineralogy, according to the definition of Berzelius, is 'the science that treats of the combinations between the inorganic elementary substances that are found on or beneath the surface of the earth, as well as of the forms which they assume, and the various foreign admixtures with which they make their appearance.' But as it is chemistry that acquaints us with the inorganic elementary substances of the globe individually, as well as with the laws according to which they combine, it thence follows that mineralogy, considered as a science, is but a branch or extension of chemistry. Chemistry, taking cognisance, as it does, of all the possible combinations of the simple elements among themselves, ought to provide the theoretical basis of mineralogy by declaring which of all these possible combinations have a mineral result. And, on the other hand, the mineralogist ought to assign the actual minerals in his possession their true places in this theoretical scheme, by first ascertaining their chemical composition, and then arranging them, each under its proper chemical denomination, according to what appears to be its essential constitution. There are, however, serious impediments in the way of such a perfect system of mineralogy—impediments arising not only from the difficulty of accurate analysis of minerals, but also from the difficulty of deciding, after the analysis is made, which of the ingredients of the mineral are to be regarded as essential, and which as mere foreign admixture. Nevertheless, as it was necessary to make a beginning, Berzelius proposed, as a suitable chemical basis for mineralogy, a scheme of classification founded on the peculiar doctrine entertained by profound chemists, that the chemical combinations of substances depend on certain electrical relations and repugnances operating among their ultimate molecules or particles.

According to this doctrine, the various elementary substances of which, so far as chemists yet know, all matter is composed, may be arranged in a certain order indicative of the degrees of their electrical susceptibility with regard to each other, commencing with the most *electro-negative*, as it is called—that is, with those which, if separated by the voltaic battery from any body into whose composition they entered as an ingredient, would, in obedience to the electrical law of attraction of opposites, tend rather to the positive pole of the battery; and proceeding to the most *electro-positive*—that is, to those which in similar circumstances would tend rather to the negative pole. The following is the approximate arrangement of this kind given by Berzelius of the simple elementary substances that were known at the time when he proposed his system in its final form:—

CLASS I.

Name.	*Chemical Symbol.*	*When Discovered.*
Oxygen (a gas)	O	By Priestley in 1774.

CLASS II.—Metalloids, or simple inflammable non-metallic bodies.

Sulphur	S	Known to the ancients.
Nitrogen or azote (a gas)	N	
Chlorine (a gas)	Cl	By Scheele in 1774.
Phosphorus	P	... A Dutch chemist in 1669.

Name.	*Chemical Symbol.*	*When Discovered.*
Fluorine	F	
Boron	B	By Davy in 1807.
Carbon	C	
Hydrogen (a gas)	H	
Selenium	Se	... Berzelius in 1818.

CLASS III.—Metals.

Division 1.—Electro-negative metals, or metals whose oxides tend rather to act the part of an acid when combining with other oxides.

Arsenic	As	By Brandt in 1733.
Chromium	Cr	... Vauquelin in 1797.
Molybdenum	Mo	... Kielm in 1782.
Tungsten (Wolfram)	W	... D'Elhuiart in 1781.
Antimony (Stibium)	Sb	... Basil Valentine in 1490.
Tellurium	Te	... Müller in 1782.
Silicium	Si	... Davy in 1807.
Columbium (Tantalum)	Ta	... Hatchett in 1802.
Titanium	Ti	... Gregor in 1791.
Aluminum	Al	... Wöhler in 1827.

Division 2.—Electro-positive metals, or metals whose oxides rather act the part of bases when combining with other oxides.

Osmium	Os	By Tennant in 1803.
Iridium	Ir	... Tennant in 1803.
Platinum	Pl	... Wood in 1741.
Gold (Aurum)	Au	Known to the ancients.
Rhodium	R	By Wollaston in 1803.
Palladium	Pd	... Wollaston in 1803.
Mercury (Hydrargyrum)	Hg	Known to the ancients.
Silver (Argentum)	Ag	do do
Copper (Cuprum)	Cu	do do
Bismuth	Bi	By Agricola in 1530.
Tin (Stannum)	Sn	Known to the ancients.
Lead (Plumbum)	Pb	do do
Nickel	Ni	By Cronstedt in 1751.
Cobalt	Co	... Brandt in 1733.
Uranium	U	... Klaproth in 1789.
Zinc	Zn	... Paracelsus in 1530.
Iron (Ferrum)	Fe	Known to the ancients.
Manganese	Ma	By Scheele in 1784.
Cerium	Ce	... Hisinger in 1804.
Zirconium	Zr	... Berzelius in 1818.
Yttrium	Y	... Wöhler in 1827.
Glucinum	G	... Wöhler in 1827.
Magnesium	Mg	... Bussy in 1830.
Calcium	Ca	... Davy in 1807.
Strontium	Sr	... Davy in 1807.
Barium	Ba	... Davy in 1807.
Lithium	L	... Arfwedson in 1818.
Sodium (Natronium)	Na	... Davy in 1807.
Potassium (Kalium)	Ka	... Davy in 1807.

Some changes have been made in this arrangement, as the mutual electrical relations of the various bodies have been better ascertained; and in order to complete the table, various elements that have been discovered more recently require to be inserted at their proper places—as *Iodine* (I) and *Bromine* (Br) among the metalloids, to which class *Silicium* or *Silicon* is also now transferred; and among the metals, the rare substances *Cadmium* (Cd), *Thorium* (Th), *Vanadium* (V), and a few others.

Thus corrected and completed, the table would exhibit an electro-chemical list of nearly sixty simple elementary substances, by the combinations of which among themselves all the known varieties of matter, minerals included, are formed. But according to the theory followed by Berzelius, these combinations are determined in some mysterious manner by the electrical relations in which the combining ingredients stand to each other. In other words, compound bodies are always found to consist of ingredients of opposed electro-chemical nature, each *electro-positive* substance in the compound being always answered by one that is *electro-negative;* as if the act of combination consisted in the rearrangement of the molecules by the rushing together of the two electricities. Nay, farther, we are to believe that 'the force by which any compound is held together is proportioned to the degree of opposition that exists between the electro-chemical natures of the ingredients'—that is to say, a compound formed by the union of two substances, the one of which is extremely electro-positive (as, among simple bodies, potassium), and the other extremely electro-negative (as, among simple substances, oxygen), will hold together more tenaciously than one formed by the union of two substances, the one moderately electro-positive, and the other moderately electro-negative.

Proceeding on this theory of the nature of chemical combination, and adopting, in connection with it, the foregoing table, in which the simple substances are arranged in their probable electro-chemical gradation, Berzelius proposed a choice of two methods of mineralogical classification:—

According to one of these methods, *each of the simple elementary bodies enumerated in the table is to be made the head of a distinct mineralogical family, consisting of the simple body itself, and all its combinations with other elementary bodies more electro-negative than itself—that is, standing above it in the table.* Thus oxygen would form one family, consisting of itself alone; another family would consist of sulphur and its compounds with oxygen; a third of azote or nitrogen and its compounds with oxygen and sulphur; a fourth of chlorine and its compounds with oxygen, sulphur, and azote; and so on through the whole list, the families becoming at least theoretically larger—that is, including a greater number of possible minerals as they approached the electro-positive extremity of the list. The last family, for example, would consist of potassium, and all its possible combinations with oxygen, with the metalloids, and with the metals above it in the list. This method of classification has its advantages for theoretical purposes, but for practical purposes the other method has been preferred.

According to the second method, the denominations of the different mineral groups are derived not from the *electro-positive*, but from the *electro-negative* side of the parentage: in other words, *each of the simple elementary substances is constituted the head of a group, consisting of itself, and all its combinations with other elementary substances more electro-positive than itself—that is, standing below it in the table.* Thus group 1*st* would consist of oxygen and its compounds with all the bodies below it in the list; group 2*d*, of sulphur and its compounds, with all below it in the list; group 3*d*, of azote or nitrogen and its compounds, with all below it in the list; and so on through the whole table, the groups necessarily becoming smaller till we reach the last, which would consist of potassium alone. Such would be the arrangement in its perfect and extended form; but as, in point of fact, the oxygen group of itself exhausts more than three-fourths of the mineral substances actually existing in nature, leaving but a scantling to be distributed among the remaining groups (the instances of chemical combination in which oxygen does not form an ingredient being rare), it is found more convenient in practice to reverse the order of the groups, beginning at the potassium extremity of the scale; and also to separate the continuous catalogue of groups into two great orders or divisions —the *first*, including all the existing mineral groups formed by the mutual combinations of the elementary bodies, with the single omission of oxygen; and the *second*, comprising the solitary but populous group of oxygenised compounds. The classification would then stand thus:—

ORDER I.—NON-OXIDISED BODIES.

Division 1. The electro-positive metals, and their compounds among themselves.

Division 2. The electro-negative metals, and their compounds among themselves, or with the electro-positive metals.

Division 3. The metalloids, and their compounds among themselves, or with the electro-negative and electro-positive metals.

ORDER II.—OXIDISED BODIES.

Division 1. Oxides in uncombined states, or the simple combinations of oxygen with individual elementary bodies more electro-positive than itself, consisting of—

1. Acids, or oxides of the metalloids and electro-negative metals;

as, for example, sulphuric acid, nitric acid, chloric or muriatic acid, phosphoric acid, fluoric acid, boracic acid, carbonic acid, arsenious acid, chromic acid, molybdic acid, tungstic acid, called also scheelic acid, tantalic or columbic acid, titanic acid, silica or silicic acid, and alumina or aluminic acid; all which acids are simple combinations of oxygen with the metalloids, or electro-negative metals whose names they respectively bear.

2. Basic or salifiable oxides, consisting of oxides of the electro-positive metals; as, for example, oxide of iron, of tin, of copper, of lead, of calcium (lime), &c.

Division 2. Oxides in combined states, or the combinations of the foregoing simple oxides (acids and bases) among themselves. These, arranged on the same leading principle of deriving the denomination of a compound from its most electro-negative ingredient (which is in this case the acid), and might be enumerated as follows:—

Group 1. Sulphates, or the combinations of the oxide of sulphur (sulphuric acid) with all other oxides.

Group 2. Nitrates, or the combinations of oxide of nitrogen (nitric acid) with all other oxides more electro-positive than itself.

Group 3. Muriates, or the combinations of the oxide of chlorine (muriatic acid) with all other oxides more electro-positive than itself.

Group 4. Phosphates, or the combinations of oxide of phosphorus (phosphoric acid) with all other oxides more electro-positive than itself.

Group 5. Fluates, or the combinations of oxide of fluorine (fluoric acid) with all other oxides more electro-positive than itself.

Group 6. Borates, or the combinations of oxide of boron (boracic acid) with all other oxides more electro-positive than itself.

Group 7. Carbonates, or the combinations of oxide of carbon (carbonic acid) with all other oxides more electro-positive than itself.

Group 8. Arseniates, or the combinations of oxide of arsenic (arsenious acid) with all other oxides more electro-positive than itself.

Group 9. Chromates, or the combinations of oxide of chromium (chromic acid) with all other oxides more electro-positive than itself.

Group 10. Molybdates, or the combinations of oxide of molybdenum (molybdic acid) with all other oxides more electro-positive than itself.

Group 11. Tungstates, or the combinations of oxide of tungsten (tungstic or scheelic acid) with all other oxides more electro-positive than itself.

Group 12. Tantalates, or the combinations of oxide of tantalum or columbium (tantalic, or columbic acid) with all other oxides more electro-positive than itself.

Group 13. Titaniates, or the combinations of oxide of titanium (titanic acid) with all other oxides more electro-positive than itself.

Group 14. Silicates, or the combinations of oxide of silicium (silica, or silicic acid) with all other oxides more electro-positive than itself.

Group 15. Aluminates, or the combinations of oxide of aluminium (alumina, or aluminic acid) with all other oxides more electro-positive than itself.

Such is the Berzelian method of classifying minerals, and such, with some slight modifications (occasioned partly by changes made by later chemistry in the number and electro-chemical order of the simple elementary substances, partly by mere considerations of convenience), is the method adopted in the British Museum. Complex as it may appear in the statement, it yields in the application a most simple and beautiful result; and we are satisfied that any visitor of the mineralogical section of the museum, who may take the slight preliminary trouble of understanding the foregoing exposition, will derive from the inspection of the minerals presented to his notice far more pleasure and profit than if he were to come upon them unprepared with the due knowledge of the principles on which they are arranged. But before accompanying the visitor in his examination of the cases of minerals one by one, it will be useful to illustrate further the method of classification, by pointing out how it would be applied practically in the case of an individual mineral supposed to come for the first time into the hands of the scientific mineralogist.

Let the mineral in question be the *beryl*, and of that variety to which the special name of *emerald* is given in ordinary mineralogical language; it is proposed to give this mineral its proper place in a cabinet arranged according to the Berzelian system. Mere inspection, or, at all events, the application of most simple tests, will prove in the first place that the emerald is not a native metal, whether electro-positive or electro-negative, nor an unoxidised metallic compound, nor a metalloid, nor an unoxidised metalloidal combination. The presence of oxygen in its composition being ascertained, it will at once be referred to the second order of minerals—that of oxidised bodies. To determine further its place in this order, a portion of it must be submitted to chemical analysis—that is, to decomposition by artificial means. Suppose (as was actually the case in an analysis by Klaproth of a piece of a Peruvian emerald) that the result shows 68·50 per cent. of silica (oxide of silicon), 15·75 per cent. of alumina (oxide of aluminium), 12·50 per cent. of glucina (oxide of glucinium), 1·00 per cent. of oxide of iron, 0·30 per cent. of oxide of chromium, and 0·25 per cent. of lime (oxide of calcium); leaving a small fraction for loss in the process. Here we have a very complex mineral, consisting of an assemblage of no fewer than six oxides. But of these the three last—namely, the oxides of iron, chromium, and calcium—may be abandoned as mere accidental admixtures of foreign matter, important, indeed, as determining the commercial or even the cabinet value of the mineral (the oxide of chromium, for example, giving it the beautiful green tint that is so much admired), but not essential to the constitution of what is chemically and scientifically the emerald. The reason why these particular ingredients out of the six are abandoned, is partly that each of them is occasionally found wanting in what is nevertheless called an emerald; but more strictly *because the proportions in which they are found are not any of those in which alone, chemistry teaches, true chemical combination can take place.*

To enter more particularly into this subject would be to trench on the most intricate portion of chemical science—the atomic theory. Suffice it to say, that chemists have ascertained that all the bodies in nature, simple or compound, may have a particular figure or number attached to them, expressing the smallest proportion in which they will unite chemically with other bodies. Thus, to make a chemical union between oxygen and iron, it is found that the iron and the oxygen must come together in portions that are to each other in weight as 339·21 is to 100, or as some multiple of the former number is to some multiple of the latter. These numbers are said to represent the *atomic weights* of the substances to which they are severally attached—that is, the relative weights of the atoms or ultimate particles of which they are composed; and whenever we find a union where the ingredients do not exist in quantities exactly corresponding to their atomic weights, we are to conclude that the union is in part at least mechanical. Or to express the same thing in the form in which it is applicable in mineralogy:—'When a mineral is analysed, and its constituent parts ascertained, we are to regard only those that present themselves in such definite proportions as are consistent with their atomic weights as essential elementary parts of the mineral.' Applying this rule in the present case, we have to reject the oxides of iron, chromium, and calcium, and retain only the other three oxides as true chemical components of the emerald—namely, silica, the chemical symbol of which is $\dddot{\mathrm{Si}}$ (the Si being the chemical symbol of silicon, and the three dots standing for oxygen, and implying that three atoms of oxygen must conjoin with one of silicon, in order to form one of silica); alumina, the chemical symbol of which is $\dddot{\mathrm{Al}}$; and glucina, the chemical symbol of which is $\dddot{\mathrm{G}}$. The atomic proportions in which Berzelius found that these three oxides united in the emerald were as follows:—$6\ \dddot{\mathrm{Si}} + 2\ \dddot{\mathrm{Al}} + 1\ \dddot{\mathrm{G}}$—that is, he found that *six* atoms of the first oxide, *two* of the second, and *one* of the third, must come together in order to form one atom of emerald. Wherever, therefore, we find the emerald, there we may be sure that nature or art has previously assembled together the three oxides—silica, alumina, and glucina; marshalling the atoms of the first in troops of six, those of the second in pairs, and those of the third singly. At some wild electric touch, sent shivering through the bed in which they lie, these three earths, common and value-less in themselves, spring together in glassy union, forming the new substance called emerald. In their haste, however, they drag with them, as it were, particles of the various foreign substances that chance to be lying round them—whether iron, chrome, or lime; hence the varieties of tint and appearance in emeralds, from the dirty yellow thing which the finder flings away, to the clear green gem that is fit for a monarch's sceptre.

Carried to this point, the analysis of the emerald enables us to give it its place in the second division of the second order of minerals—that is, among the oxides in combined states. It remains, however, still to determine to which group of this division it belongs. Applying the leading principle of the Berzelian method of classification as already expounded—namely, that the scientific denomination of a mineral is to be derived from its most electro-negative ingredient, we arrive at once at the conclusion that the emerald is to be ranked in the group of silicates, silica being more electro-negative than either alumina or glucina, and capable, therefore, of acting the part of an acid (silicic acid) in combination with either as a base. But as in every chemical combination there must be found an electro-negative ingredient or acid answering to every electro-positive or base, and as in the present case we have *two* electro-positive ingredients or bases—the alumina and glucina—it follows that the silica must act simultaneously as an acid to both, distributing itself, as it were, between them; going partly with the alumina, so as to form silicate of alumina, and partly with the glucina, so as to form silicate of glucina. Hence the emerald is placed in that particular section of the group of silicates appropriated to what are called 'Silicates with Double Bases.' The conclusion of Berzelius was, that the silica or silicic acid apportioned itself in the emerald thus:—

$$\dddot{\mathrm{G}}\ \dddot{\mathrm{Si}}^{4} + 2\ \dddot{\mathrm{Al}}\ \dddot{\mathrm{Si}}^{2};$$

that is, of the *six* atoms of silica known to exist in the mineral, *four* went with the single atom of glucina, forming one atom of silicate of glucina, and the remaining *two* went with the two atoms of alumina, forming two atoms of silicate of alumina; and these two silicates then united (that is, the single atom of silicate of glucina, and the two atoms of silicate of alumina) to form the emerald. Some chemists, however, vary the formula thus—$\dddot{\mathrm{G}}\ \dddot{\mathrm{Si}}^{3} + 2\ \dddot{\mathrm{Al}}\ \dddot{\mathrm{Si}}^{3}$; but in either case the emerald is to be accounted as a conjunct silicate of glucina and alumina, and to be placed accordingly among the silicates with double bases. *Within* this general denomination the mineral would be farther specialised by an accurate mineralogist, by being placed in a *genus* assigned to silicates of the two particular bases glucina and alumina; and within this *genus*, the precise chemical composition, as given in the preceding formula, would determine the *species*—that is, the beryl or emerald. Lastly, the foreign admixtures in any individual emerald—as iron, chrome, &c.—would mark the *variety*.

The following exhibits the arrangement of the minerals in the museum, with the numbers of the cases in which the different groups are deposited :—

CLASS I.—NON-OXIDISED BODIES, Cases I to XII inclusive.

Division 1. Electro-positive native metals and their mutual combinations; occupying Cases I and II, and part of Case III.

Division 2. Electro-negative metals and metalloids, both native, and in combination with the electro-positive metals ; occupying the suite of cases from III to XII inclusive.

CLASS II.—OXIDISED BODIES, Cases XIII to LIX inclusive.

Division 1. Oxides of the electro-positive metals, comprising the most common metallic ores; occupying Cases XIII to XVIII inclusive.

Division 2. Oxides of the electro-negative simple substances (electro-negative metals and metalloids) and their various combinations among themselves, or with the oxides of the electro-positive metals; occupying Cases XIX to LIX inclusive, and subdivided into groups. Thus—

Group 1. Alumina and aluminates ; occupying Case XIX.
Group 2. Silica and silicates ; occupying the suite of cases from XX to XXXVII½ ; and comprising—
  1. Varieties of the simple oxide itself—silica—Cases XX-XXIV inclusive ;
  2. Silicates with one base—Cases XXV-XXVI.
  3. Silicates with several bases—Cases XXVII-XXXVII½.
Group 3. Titanic acid and titanates—Case XXXVII½.
Group 4. Vanadates,
Group 5. Tungstates, } all included in the single Case XXXVIII.
Group 6. Tantalates,
Group 7. Borates,
Group 8. Chromates, } all included in Case XXXIX.
Group 9. Molybdates,
Group 10. Borates containing silicates—Case XL.
Group 11. Carbonates ; occupying the suite of cases from XLI to LI inclusive.
Group 12. Nitrates ; occupying part of Case LII.
Group 13. Sulphates ; occupying part of Case LII, and Cases LIII, LIV, and LV.
Group 14. Arsenious acid and arseniates ; occupying Case LVI.
Group 15. Phosphates ; occupying Case LVII.
Group 16. Fluorides ; occupying Case LVIII.
Group 17. Chlorides ; occupying Case LIX.

APPENDIX.—Cases LX and LX A.

Organico-chemical combinations, or mineral substances of organic origin ; a small class as compared with that of the purely inorganic minerals, but including minerals of great importance and utility. They are divided into *salts*, *resins*, *bitumens* or *bituminous substances*, and *coal* or *carbonised substances*. Specimens of all these are contained in the two cases marked LX and LX A.*

A glance at the preceding classification will show which kinds of minerals are the most abundant; as, with the exception perhaps of coal, and one or two other substances that are either too largely or too meagrely represented, each kind of mineral has a space assigned to it in the arrangement nearly proportionate to the space it occupies in the actual mineral world. The metallic ores, the silicates, and the carbonates, for example, are the groups that occupy most room in the cabinet, and these are also the most abundant in nature. There are doubtless undiscovered mineral substances that belong to none of the groups yet recognised; still, it may be asserted, on the whole, that if the entire crust of the earth, vast and apparently heterogeneous as it is, were taken to pieces, and separated into its component parts, it would be found to consist of an aggregate of nothing else than the foregoing metals, metalloids, oxides, acids, aluminates, silicates, sulphates, &c. So strangely, and yet so simply, is the solid earth on which we walk concocted and built up!

The cases containing the minerals (the *wall cases* in the same gallery are reserved for the fossils) are ranged in their order—the first thirty along one side of the entire suite of rooms constituting the North Gallery, commencing in Room I, and ending in Room V; and the remaining thirty along the other side, in a reverse direction, commencing in Room V, and ending in Room I. Taking them in this order, the visitor comes first on—

CASES I-III, CONTAINING THE ELECTRO-POSITIVE NATIVE METALS AND THEIR UNOXIDISED COMBINATIONS.—The most interesting specimens in this group are those of *native iron*—that is, iron in an unoxidised state. Native iron of terrestrial origin is of exceedingly rare occurrence, the metal having so strong a power of combination with oxygen, that not only in nature does it always exist in the form of an ore or oxide, but that, even when artificially purified, it tends to return to that form by absorbing oxygen from the atmosphere or from water. Occasionally, however, there are found on the earth's surface considerable masses of the purest iron, with scarcely a tinge of oxide in them. Such masses were sometimes discovered by the ancients, and, if large, were prizes of no small value; and at the present day, the natives of some of the arctic countries manufacture points for their weapons out of similar fragments. It is now a known fact, that almost all these masses of unoxidised iron at present existing on the earth's surface, or that were ever found, are not native to it, but have fallen from the heavens. In the ancient historians we have frequent accounts of showers of stones and of red-hot meteors that were seen falling to the earth, and some of which were taken up from the spot where they had fallen, and kept as sacred relics, or fiery bolts fresh from the fingers of the gods. Such accounts were treated as fables by the more sceptical moderns; and it was not until many well-authenticated cases of similar phenomena had occurred in modern times—some in the presence of multitudes of people, and some even fatal to human life—that scientific men recognised the existence of these *aerolites* or *meteoric stones*, of which it is now certain that showers have been falling upon the earth since first it was inhabited. The appearance of such aerolites when falling is various. Sometimes a ball of fire is seen descending from a great height in the atmosphere, which blazes as it falls, and at last explodes in the air with a loud noise, the fragments coming to the ground; sometimes, without exploding, the whole mass falls with a violent crash into the earth, burying itself to the depth of ten or fifteen feet; sometimes, when the sky is quite clear, a small pitch-black cloud is seen forming in it, from which, in an instant or two, a shower of stones is shot with a loud report, as from a cannon-mouth; and sometimes the appearance is merely that of fiery lines shooting downward, like a shower of luminous powder. The instances of such phenomena now on record are almost innumerable, and there is scarcely a spot of the earth's surface of any considerable extent that has not been struck by one or more of these aerolites. In the museum there are upwards of fifty different specimens of meteoric stones, either entire as they fell, or broken off from larger masses; and to each specimen is attached a label specifying the place where, and the day, and sometimes even the hour, when it fell. The specimens, though both included in the portion of Case I, devoted to native iron, are divided into two classes, to exhibit the two varieties of which aerolites have been found to consist—namely, 1. *Meteoric iron masses*, composed usually of from 90 to 96 per cent. of pure iron, with a tinge of nickel, copper, cobalt, arsenic, &c.; and 2. *Earthy meteorites*, composed of earthy matter of various kinds and different textures, and containing a larger or smaller per-centage (sometimes as small as 2 per cent.) of iron. Among the former the most interesting specimens are—a portion of a large mass of iron which fell at Agram in Croatia on the 26th of May 1751; a large piece of a mass of iron, weighing 1680 pounds, discovered by the Russian traveller Pallas in 1772, on the top of a mountain in Siberia, and now in the museum of St Petersburg; specimens from two masses which fell, the one at Otumpa in South America, and the other in Brazil, and which are probably the largest aerolites known, being about eight feet long each; various specimens from the United States; and various European specimens that have fallen quite recently. Some of the specimens are polished, to exhibit the purity of the metal; and there are also to be seen in the same case some native American and arctic weapons tipped with meteoric iron. Among the specimens of earthy meteorites containing iron are—a fragment of one, weighing 270 pounds, which fell at Erightheim in Alsace, November 7, 1492, when the Emperor Maximilian, then king of the Romans, was on the point of engaging with the French army; an entire meteorite, weighing 56 pounds, which fell at Thwing in Yorkshire, December 13, 1795; one of smaller size, which fell near Glasgow, April 5, 1804; a fragment of one which fell at Adare, in the county of Limerick, Ireland, September 10, 1813; and many of more recent date.

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* A comparison of this arrangement with the Berzelian scheme in its original and theoretical form (as given in pages 121, 122), will at once point out the deviations that have been made from the latter, and the reason of them. It will be seen, for example, that in Order I the two divisions of the electro-negative metals and the metalloids have been thrown into one; that in Order II the acids, where they are given at all, are removed from the 1st division to the 2d, where they are given, each acid along with its proper group of combinations (as 'alumina and aluminates,' 'silica and silicates,' 'arsenious acid and arseniates,' &c.); and lastly, that the groups in this second division have been taken in very nearly their reverse order, beginning at the electro-positive end (the aluminates) instead of their electro-negative (the sulphates, chlorides, &c.) For all this there are sufficient reasons.

After looking at these extraordinary masses of metal and stone, all of which once hung blazing in the atmosphere of our earth, the visitor will naturally be curious to know what is the belief regarding their origin. Three distinct hypotheses have been entertained respecting aerolites. The first is, that they are of strictly terrestrial origin, being formed in the atmosphere by some mystic chemical process. This hypothesis is now universally abandoned; for though there have been showers of mineral substances, and sometimes even of animals—such as frogs and fishes—which were evidently the mere descent upon the earth of what had previously been whirled up from it by the wind or by a waterspout, such phenomena are quite distinct from those now in question. Another hypothesis attributes a lunar origin to aerolites. The moon, it is known, contains volcanoes of enormous size, which are often in a state of eruption, and it is calculated that occasionally a stone might be projected from one of these volcanoes with such force, as (the moon being a small body, and exercising a comparatively feeble attraction) to leave the sphere of the moon's attraction, and come within that of the earth. There being no water in the moon, and little or no atmosphere round it, iron may very well exist there in a native or unoxidised state; and a mass of such iron, projected beyond the sphere of the moon's attraction, would remain invisible till it came in contact with the earth's atmosphere, when it would take fire, in consequence of the action of the oxygen on its surface, and present exactly the appearance of an aerolite. In favour of this hypothesis, which was strongly argued by the great French astronomer Laplace, there are some plausible reasons; but it has now given way to another, started, or at least powerfully advocated, by the German naturalist Humboldt. According to this hypothesis, the phenomenon of aerolites is identified with that of shooting-stars, and it is maintained that both are nothing else than very small cosmical bodies moving in space with regular orbits like those of the planets, but which, deflected occasionally from their course by the too near proximity of so large a body as the earth, are drawn swiftly downwards through our atmosphere. Such a hypothesis gives us new ideas of the universe to which we belong. If it is true, then, besides the sun, the planets, their moons, and the comets, all of which are luminous bodies, we are to reckon as members of the solar system an incalculable number of little masses moving like dark motes through ethereal space, and only made visible when they come so near one of the planets as to be drawn within its atmosphere, in which case, if it be during the day, they assume the appearance of aerolites—and if during the night, that of shooting-stars. From the circumstance that shooting-stars have been observed to be much more frequent at certain seasons of the year than at others—namely, from the 22d to the 25th of April; on the 17th and 18th of July; on the 10th of August; from the 12th to the 14th, and from the 27th to the 29th of November; and from the 6th to the 12th of December—it has been inferred that these asteroids or meteors go in streams, as it were, of many myriads together, and that it is only at points where such streams intersect the earth's orbit that abundant falls of aerolites or shooting-stars take place. At all seasons of the year, however, they fall singly or in small numbers; and every aerolite preserved in a museum is but a fragment of some asteroid (sometimes, it is believed, of several hundred feet in diameter) that once moved through space as an independent body, proceeding perhaps in its orbit to the extreme limits of the solar system. The masses of native iron, therefore, and the pieces of stony crust, at which the visitor looks in the north gallery of the British Museum, are more than mere minerals: they are hand specimens, brought from afar, to show us that the other planetary bodies are made of very much the same material as our own.

In the same case with the native iron the visitor sees specimens of native copper, of native lead, of native bismuth, and of artificially-produced titanium. Native *copper* is usually in the form of threads or thin branchy crystallisations bedded in rock; occasionally, however, it is found in considerable masses. The largest masses ever found were—one in Brazil, weighing 2620 pounds; and one in Canada, measuring 15 feet in circumference. The metal is found in almost all parts of the earth: in England, the richest mines are in Cornwall and Stafford. The ancient Greeks imported their copper from the island of Cyprus—hence the name *Cuprum*, or copper. The specimens of native *lead* shown in the museum are all of volcanic origin; among them is a medal cast in lead ejected from Vesuvius in 1631. Except in such cases, nature hardly ever supplies the metal otherwise than in the form of ore or oxide. *Bismuth* is a brittle crystalline metal of a brownish-white colour; it is not plentiful. It is found in the tin mines of Cornwall, but more abundantly in Saxony and Siberia. Although not used much alone, it is highly serviceable in the arts when combined with other metals. Mixed with lead and tin, in the proportion of 1 part to 5 of the former and 3 of the latter metal, it forms an excellent solder. Retain the same quantities of lead and tin, but increase the quantity of bismuth to eight times as much, and the result will be a metal so fusible, that teaspoons made of it will melt in boiling-water. Possessing the singular property of expanding as it cools, bismuth is also a most valuable ingredient in type-metal. In dyes and cosmetics it is also sometimes employed; and the story is told of a lady at a party who, having her face painted with a delicate white cosmetic containing bismuth, was, to the horror of all present, seen slowly becoming black under the remorseless influence of the fire and the gaslight. *Titanium* is a very rare metal, of a glittering coppery colour, occurring sometimes in granite, mica slate, &c. in the form of small cubes: the specimen in the museum was artificially produced at one of the great Welsh iron works.

The metals contained in the second case are native silver, native mercury, and hydrarguret of silver—that is, native mercury combined with native silver—native platinum, native palladium, and osm-iridium, or native osmium combined with native iridium. Native *silver* is occasionally found in all the places that yield silver ore; as in Mexico and Peru, Saxony, the Hartz Mountains, Norway, Siberia, Spain, and in Cornwall and Devonshire in England. It appears in various forms, but usually in threads, or tree-like crystallisations, twining round small rocky fragments. There are some beautiful specimens in the museum, chiefly from the Hartz Mountains. The specimens of native mercury, or quicksilver, are in the form of small shining globules, bedded in sparry limestone, or in pieces of cinnabar and other quicksilver ores. It is found in all the quicksilver mines; as in those of Almaden, near Cordova in Spain, of Idria in Austria, and of Huancavelica in Peru. In most of these mines is also found the hydrarguret of silver, or *native amalgam*, as it is called, in the form of regular crystals, generally dodecahedrons. Of this amalgam the miners in Mexico make a paste, which they mould into figures of men, animals, &c. with much neatness: some specimens of their workmanship are placed in the museum beside the hydrargurets. A similar amalgam, artificially produced, is employed by dentists in stopping decayed teeth. *Platinum*, which is at once the heaviest, the least fusible, and one of the most ductile and malleable of the known metals, is of a steel-white colour, somewhat less brilliant than that of silver. It was unknown till towards the middle of last century, when it began to be imported in very small quantities from South America. It has since been discovered in the Ural Mountains in the Russian territories. It is found in small grains or scales of a gray, metallic appearance, and very heavy; in which state it is almost invariably combined with gold, iron, lead, palladium, osmium, iridium, rhodium, and silver, about one-half or three-fifths of the mass being pure platinum. The crude particles thus found rarely exceed a pea in size; sometimes, however, they are as large as a hazelnut; and in 1831 a mass of platinum, weighing twenty pounds, was discovered in one of the Russian mines. The extraordinary combination of properties in platinum —its durability, its incorrodibility by the common acids, its infusibility, its weight, its ductility and malleability, the ease with which it can be welded, and finally, its beautiful appearance, would all render it a favourite metal in the arts, were it not for the extreme difficulty of extracting it from the ore. This process is so tedious, that, combined with the rarity of the metal, it makes pure platinum worth four or five times its weight of pure silver. The purposes to which it is applied are consequently few. It is made into small crucibles for chemical experiments; it is used also for mirrors in reflecting telescopes; and recently a platinum coinage has been attempted in Russia. To show the appearance of the metal when wrought, a Russian coin made of it is placed beside the crude grains in the museum. The specimens of *palladium* and *osm-iridium*, which complete the contents of this case, are in a wrought state. Palladium is not unlike platinum in colour and lustre; but though very ductile and malleable, is not nearly so heavy. It is a very rare metal, and was discovered accidentally by Wollaston in 1803, while he was experimenting with a piece of ore of platinum. In commemoration of this discovery, the Wollaston medal of the Geological Society of London is made of palladium. A native alloy of palladium and gold is now imported from Brazil; the metal, however, has hardly yet been applied in the arts. *Osmium* is a dark-blue metal, discovered by Mr Tennant in 1803 in combination with platinum; it is insoluble in the common acids, but soluble in potash. Combined with oxygen in the proportion of 1 atom of the metal to 4 of the gas, it forms an oxide (osmic acid) of poisonous qualities, and having a very disagreeable odour. Hence the name of the metal—from the Greek word *osme*, smell. *Iridium*, which was discovered by the same experimenter at the same time, and under the same circumstances, is a whitish metal, also insoluble in acids, and of specific gravity nearly equal to platinum.

The first half of Case III is devoted to specimens of native *gold*, and of *aururets*, or native alloys of gold with other metals. Gold is the most ductile and malleable of all the metals; it is not tarnished by any of the common acids; its specific gravity is 19·3, or inferior only to that of platinum and iridium. It is found native in small crystals in threads, and in grains of various sizes, the largest being called *pepitas*. Single pepitas are said occasionally to have been discovered weighing twenty, forty, or even sixty pounds. Gold is obtained by two methods—either by direct mining in the rocks in which it is bedded, or by gathering and washing the sands of rivers that in the upper part of their course have flowed through such rocks. The metal is very generally diffused over the globe, being found in Brazil, Peru, Mexico, California, Hungary, Siberia, in Cornwall in England, the Leadhill district in Scotland, and Wicklow county in Ireland. The mines in the new world, however, are the only ones that repay the labour employed in extracting the metal. For use in the arts, gold is usually alloyed with other metals—as silver, copper, platinum, &c. The standard gold of Great Britain employed in coinage, &c. consists of 11 parts of pure gold and 1 of copper, the copper being added as a hardening ingredient. Copper deepens, and silver whitens, the colour of the gold with which they are respectively alloyed. Jewellers' gold is an alloy of less value than standard gold; though, from the skill with which a rich gold surface is sometimes imparted to an inferior alloy, it is difficult to discern at once the real value of any article of gold manufacture. The name usually given to native aururets, or alloys of gold, is *electrum*. The electrum of Smeof in Siberia contains one-third of silver.

CASES III-XII, CONTAINING ELECTRO-NEGATIVE METALS AND METALLOIDS, WITH THEIR UNOXIDISED COMBINATIONS.—Three electro-negative metals are here distinguished from the others of their class by the capacity which they show of combining with other substances without the help of oxygen—namely, tellurium, antimony, and arsenic; and three metalloids are then similarly distinguished in *their* class—namely, carbon, selenium, and sulphur. In Cases III and IV, accordingly, we have *tellurium* and *tellurets*, *antimony* (stibium) and *stibiurets*, and *arsenic* and *arseniurets;* while Cases IV-XII exhibit in succession *carbon* and *carburets*, *selenium* and *seleniurets*, and *sulphur* and *sulphurets*.

Tellurium and Tellurets (Case III).—Native tellurium is a very scarce metal, of a white or grayish colour. When heated, it emits a pungent odour, not unlike the smell of horse-radish. It is easily fusible; its specific gravity is about 6·12. It combines with bismuth, with silver, with lead, with silver and lead, and with silver and gold, forming in each case a different-looking mineral. Telluret of bismuth, formerly called molybdena-silver, is found in small crystals of a steel-gray colour at Bastnaes in Norway; telluret of silver is found in Siberia; telluret of lead, called foliated tellurium, or Nagyag ore, is found chiefly in Transylvania; telluret of silver and lead (yellow tellurium) in the same place; where also is found the most valuable of the tellurets—that of silver and gold, called graphic tellurium. These tellurets have hardly been applied to any use in the arts.

Antimony and Stibiurets (Case III).—Pure native antimony is of glittering white colour; its specific gravity is 6·7; it melts easily, but is extremely brittle. The ore of antimony, from which the pure metal is procured, is found in Cornwall, very abundantly in Ayrshire, and more or less abundantly in different parts of Saxony, Siberia, France, Spain, the Hartz Mountains, and America. The specimens of native antimony in the museum are from Dauphiny. Antimony by itself is of little use; but mixed with other metals, it is largely employed in the manufacture of printing-types, stereotype-plates, Britannia-metal, and other kinds of pewter. It is also an ingredient in various mineral pastes and dyes; and when pounded with certain other substances, it forms a very inflammable compound used in the manufacture of blue-lights. Among the native alloys of antimony, the most remarkable is the scarce stibiuret of silver, found in the Hartz Mountains.

Arsenic and Arseniurets (Case IV).—Arsenic, which, though known long before, was first accurately identified by Brandt in 1733, is a very soft and brittle metal, of a white or steel-gray colour, having a specific gravity of about 5·8. It is readily inflammable, and melts at the low temperature of 365 degrees, emitting, while heated, a strong odour like that of garlic. It is sometimes found native, but more frequently as an oxide, or in unoxidised combination with such metals as nickel, cobalt, bismuth, &c. Specimens of the arseniurets of nickel and cobalt are to be seen in Case IV. Although, as is well known, one of the most virulent poisons in nature, arsenic possesses many properties that render it useful in the arts. It is used medicinally in small quantities; and also in glass-making, candle-making, &c.

Carbon and Carburets (Case IV).—Carbon is one of the most widely-diffused elementary bodies, entering largely into the composition of vegetables and the bodies of animals. When a piece of wood is burnt, the residue, which we call charcoal, consists almost entirely of carbon; and if, in a similar manner, we were to decompose any other complex substance, we should almost certainly find in it some basis or skeleton of carbon. Nature, however, rarely furnishes carbon except in this state of combination with other elements. The nearest approach to pure carbon is found in the *diamond*, which, precious as it is, is in reality nothing more than crystallised charcoal. Chemists, indeed, have not yet been able to produce diamonds artificially by crystallising carbon; but they have again and again decomposed pieces of real diamond, and reduced them, as nearly as possible, to pure carbon. Accordingly (somewhat to the visitor's surprise, if he has been accustomed to think of carbon and charcoal as one and the same thing), the portion of Case V devoted to carbon is occupied chiefly by a range of diamonds of small and medium size, together with glass models of some of the most celebrated of the large diamonds now kept in different royal cabinets. Diamonds are here to be seen of all kinds, and all degrees of fineness. 'When perfectly pure, a diamond is as transparent as a drop of the purest water, in which state it is known as a diamond of the first water; and in proportion as it falls short of this perfection, it is said to be of the second, third, or fourth water, till it becomes a coloured one. Coloured diamonds are generally yellow, blue, green, or red; and the higher the colour, the more valuable they are, though still inferior to those absolutely transparent. Diamonds were originally discovered in Bengal, but they have since been found in other parts of India, in the East India Islands, in the Brazils, and recently in the Ural Mountains. They occur chiefly in alluvial deposits of gravel and sand, lying in detached octohedral crystals, sometimes with plain, but more frequently with rounded surfaces. The finest are cut for ornamental purposes into *brilliants*, having curvilinear faces both at top and bottom, or into *rose-diamonds*—that is, having their tops or upper surfaces cut into a number of triangular facets, but quite flat beneath. The black, dirty, and flawy ones are pulverised for the purpose of polishing others. Fractured portions, with good cutting edges, are usually set for glaziers' cutting pencils, in which state they are worth from twelve to twenty shillings; and also as *drills* for cutting other precious stones.' Being the hardest of known substances, diamonds can be cut only by their own friction one against another, and polished only by their own dust; and most diamonds, accordingly, lose about half their weight in the setting. The worth of a diamond is computed by its weight, the weight being measured in *carats* of 3¼ grains troy each. The rule is as follows:—A rough, uncut diamond, is worth as many pounds sterling as there are units in twice the square of its weight; a cut diamond is worth as much as an uncut diamond twice as heavy. Thus, to find the value of a *rough* diamond of 3 carats, 3 × 3 = 9 × 2 = 18, giving £18 as the value of the diamond. To find the value of a *cut* diamond weighing 3 carats, 3 × 2 = 6 × 6 = 36 × 2 = 72, giving £72 as the value of the diamond. Such is the technical rule; and in the case of diamonds of ordinary size it may correspond in some measure with the fact; but when diamonds exceed a certain size, their actual market value is not nearly so great as the strict application of the rule would make it. 'The largest diamond ever known was brought to the king of Portugal from Brazil. It is uncut, weighs 1680 grains, and its value is often quoted at £5,644,800. Similar extravagant valuations are applied to the famous Russian one weighing 195 carats; to that in the possession of the Great Mogul, weighing, cut, 280 carats; and to others; but it does not appear that any sum exceeding £150,000 has ever been given for a diamond. In 1837 the magnificent Nassau diamond, weighing 357½ grains of the purest water, brought only £7200. Perhaps the most perfect and beautiful diamond hitherto found is a brilliant brought from Malacca last century by a gentleman of the name of Pitt, who, after getting it cut in London, sold it to the Duke of Orleans, regent of France, for £100,000. Its weight is 136½ carats. It is now, or rather was lately, among the crown-jewels of France.' Very different substances in appearance from the diamond are the two minerals placed along with it, as of similar composition—namely, *anthracite*, which differs from other coal in being non-bituminous, and emitting no smoke when burnt; and common *graphite*, or black-lead, of which pencils are made, both of which consist chiefly of carbon, and may therefore rank as carburets.

Selenium and Seleniurets (Case IV).—Selenium is generally accounted a non-metallic elementary body, although it has quite a metallic lustre (like that of lead), as may be seen from a small medallion made of it (Case IV), exhibiting a likeness of its discoverer Berzelius. It is brittle and soft, and is not found native, but may be readily extracted from various minerals into whose composition it enters. It has not yet been applied to any distinct use in the arts.

Sulphur and Sulphurets (Cases V-XII).—This group, it will be observed, is more extensive than any of the preceding; sulphur seeming to have a capacity not possessed by any other elementary substance, of combining with other bodies independently of the assistance of oxygen. Sulphur or brimstone is, as is well known, a yellow, brittle mineral. 'It is found in most parts of the world, but most abundantly in volcanic regions, and in the immediate neighbourhood of burning mountains, as Ætna, Hecla, Vesuvius, &c. It occurs either as an efflorescence on the surface, or in masses mingled with clay, ashes, and other volcanic products. Our chief supply is from Sicily, where it occurs in beds of blue clay, and whence it is imported as dug from the mines in square masses or blocks, called "rough brimstone." The formation of sulphur is still going on wherever volcanic agency is in a state of activity. It appears to be evaporated by the subterranean heat through the crevices or fumeroles (smoke vents) of the mountains.' As sulphur is largely used in the manufacture of gunpowder, of vitriol, and of many other compounds, no less than 20,000 tons of it are annually imported into Britain. Specimens of native sulphur in all the different forms in which it is found are exhibited in the first part of Case V—splendid yellow crystallisations from La Catolica in Sicily, and from Conella in Spain, as well as sulphur in stalactitic shapes, in masses, in powder, &c. Then (Cases V-X) follow various sulphurets in the following order, each sulphuret ranking as a mineral *species*, and comprehending many varieties :—1. Sulphuret of manganese, or manganese blende (*alabandine*, *hauerite*, &c.), Case V. 2. Sulphuret of zinc, or zinc-blende, Case V. 3. Various sulphurets of iron, or iron pyrites, Case VI. 4. Sulphuret of cobalt, Case VI. 5. Sulphuret of nickel, or nickel-blende (*millerite*), Case VI. 6. Sulphuret of cadmium (*greenockite*), lately discovered in Renfrewshire, Case VI. 7. Sulphuret of copper, or copper-glance, Case VII. 8. Sulphuret of copper and iron (*copper pyrites*, *Tennantite*, &c.), Case VII. 9. Sulphuret of lead, or galena, in many varieties, Case VIII. 10. Sulphuret of bismuth, Case IX. 11. Sulphuret of copper and bismuth, Case IX. 12. Sulphuret of bismuth, lead, and copper (*needle-ore*), Case IX. 13. Sulphuret of copper and tin, or tin pyrites, found in Cornwall, Case IX. 14. Sulphuret of mercury, or cinnabar, in all its varieties, Case IX. 15. Sulphuret of silver, or silver-glance, Case X. 16. Sulphuret of antimony (*antimonite*), in various beautiful forms, compact, foliated, radiated, plumose, &c., Case X. Then follows (Cases XI, XII) a collection of *sulphur salts*, as they are called—that is, of minerals formed by the combination of sulphurets of the two electro-negative metals, antimony and arsenic, with basic sulphurets of certain electro-positive metals. The remainder of Case XII is occupied by a few additional sulphurets of electro-negative metals, including the two sulphurets of arsenic, *yellow orpiment*, found native in China and South America, and artificially produced in Saxony; and *red orpiment*, or *realgar*, found native in Saxony, Bohemia, &c. With the exception of these two last-named sulphurets of arsenic, which are used, the former as a dye in calico-printing, and the latter as a red pigment, hardly any of the numerous compounds of sulphur mentioned in this paragraph have been applied in their native combined state to any use in the arts. Many of them, however, are useful, as forming a source whence one or other of their separate ingredients may be very conveniently derived. Thus, abundance of lead is obtained from the sulphuret of lead named *galena*, which, indeed, is by far the most plentiful and valuable of all the lead-ores; *zinc-blende* yields zinc to the miner; *copper-pyrites* is more worked than any other ore of copper; and the sulphuret of mercury (*cinnabar*) is the chief source of the quicksilver of commerce.

CASES XIII-XVIII, CONTAINING OXIDES OF THE ELECTRO-POSITIVE METALS.—Enumerated in their order, these oxides are —1. Oxide of manganese (Case XIII), comprising several mineral species — as *manganite*, *hausmannite*, *braunite*, &c. The metal manganese itself, which is of a dusky white colour, and very brittle, is not applied to any purpose in the arts; but its oxides, especially the peroxide, or black oxide, as it is called (a dark earth which is found abundantly in Devonshire, Somersetshire, Aberdeenshire, and in Piedmont and the Hartz Mountains), are much used. The peroxide is the substance commonly used by chemists for producing oxygen gas in any great quantity; it is also used as a pigment, and as a brown dye in calico-printing. Recent experiments have also proved that the addition of a little manganese to British iron improves the quality of the steel made from it. Among the other oxides of manganese is one called *wad*, an earthy substance, which inflames on contact with lintseed oil. 2. Oxide of iron (Cases XIV-XVI), comprising various ores of this important metal—as *magnetic iron ore* in different forms, all strongly attracted by the magnet; *specular oxide*, or *iron-glance*, including some beautiful iridescent specimens from the island of Elba; *micaceous iron ore; red iron ore; hydrous oxide of iron*, or *brown ironstone;* and *argillaceous*, or *clay ironstone*, including a number of small round granular specimens, which descended as a shower at Iwan in Hungary on the 10th of August 1841, and were regarded as a new species of meteorites until microscopic examination proved their terrestrial origin. Of these various oxides the magnetic iron ore, the red iron ore, the brown ironstone, and the clay ironstone, are most worked by the miner. It is from the clay-iron ore especially that British iron is extracted; but the iron made from this ore is not so fine as the Indian or Swedish iron which is derived from the other three ores. 3. Oxide of copper (Case XVII), comprising *ruby-copper*, *tile-ore*, and several other ores which yield a supply of copper, inferior, however, in quantity to that obtained from copper pyrites. 4. Oxide of bismuth, or *bismuth ochre* (Case XVII), from Saxony and Bohemia. 5. Oxide of zinc (*Sterlingite*, *Franklinite*, &c.), from New Jersey (Case XVII). 6. Oxide of cobalt, or *cobalt-ochre* (Case XVII), largely used as a pigment, and for imparting a blue colour to glass. 7. Oxide of uranium, or *uran ochre* (Case XVII), found in some parts of Germany, and used as a pigment for painting on porcelain, &c. 8. Oxide of lead, or *minium* (Case XVIII), largely employed by painters in the form of *massicot* and *red-lead*, and by glassmakers in that of *litharge*. 9. Oxide of tin, or *tin-stone* (Case XVIII), including the various ores from which the metal tin is most commonly procured in Cornwall, Germany, Chili, Malacca, &c. To the oxides of tin are added some remarkable specimens of metallic tin smelted by natives in the interior of Africa.

CASES XIX-LIX.—OXIDES OF ELECTRO-NEGATIVE BODIES AND THEIR VARIOUS COMBINATIONS, divided into seventeen groups, thus:—*Alumina and aluminates; silica and silicates; titanic acid and titanates; vanadates; tungstates; tantalates; borates; chromates; molybdates; borates containing silicates; carbonates; nitrates; sulphates; arsenious acid and arseniates; phosphates; fluorides; and chlorides.*

Alumina and aluminates (Case XIX).—Alumina, or oxide of aluminium, is a very widely-diffused substance in nature, constituting, as it does, the principal ingredient in all the different kinds of clay. When indurated and crystallised in certain peculiar conditions, and in contact with certain kinds of foreign matter, small lumps of this substance form themselves into the valuable mineral called *corundite*; under which name are included, 1*st*, The noble corundite, comprehending such precious stones as the sapphire, the ruby, the Oriental amethyst, the Oriental topaz, the Oriental emerald, all of which are, therefore, but various crystallisations of the common substance that forms the basis of clays; and 2*d*, The common corundite, usually called corundum or adamantine spar, which yields the hardest and best polishing substances used by the lapidary, and certain varieties of which form a large ingredient in the well-known polishing substance *emery*, so called because found at Cape Emeri in the island of Naxos. Specimens both of the noble and the common corundite are to be seen in this case; and the curious visitor may learn by actual inspection to distinguish the precious stones included in it—the sapphire by its blue, the ruby by its red, the Oriental topaz by its yellow, the Oriental emerald by its green colour, and the Oriental amethyst by its light purplish tint. The colour depends on the nature of the specific foreign substance or substances that may have been present with the alumina when it crystallised. Among the *aluminates* in the same case—that is, the combinations of alumina with other oxides—we need mention only the chrysoberyl or cymophane, a beautiful mineral, which is an aluminate of glucina and iron.

Silica and Silicates (Cases XX-XXXVII), constituting the most extensive of all the mineral groups. Although the elementary substance silicon or silicium is never found in nature, and can only be procured artificially, its oxide, silex or silica, is so abundant, that, either by itself or in combination with other substances, it may be said to compose the greater part of the rocky crust of the earth. Silex itself assumes an almost infinite variety of forms, according to the nature of the circumstances in which its two essential ingredients, the silicon and the oxygen, have come together. A beautiful collection of these various forms of simple silex is exhibited in Cases XX-XXIV. First, in Case XX, there is a fine collection of those forms of it that constitute rock-crystal and amethyst quartz; then, in Cases XXI-XXII, there follows a collection of varieties of common quartz (the most remarkable of which are the flexible sandstone from Brazil, and the fetid quartz from Nantes), together with numerous specimens of flint, hornstone, &c. Part of Case XXII, and the whole of Case XXIII, are filled with siliceous minerals of the kind called calcedonic, the subdivisions of which are the common bluish-white calcedony; the dark-stained Mocha-stone; the flesh-red semi-transparent carnelian; the green heliotrope, which, when spotted red, is called the bloodstone; the beautiful and rare chrysoprase; the agate, celebrated for its hardness, &c. No part of the collection presents a more beautiful appearance than these calcedonic substances: Case XXIII, in particular, contains a number of carnelian pebbles, brooch-stones, agates, agate-cups, &c. sufficient to fit out a jeweller's showroom. In the next case (Case XXIV), which is also very beautiful, are arranged the varieties of the jasper and the opal, both of which are but peculiar forms of silex. Among the jaspers, which are of all colours—red, brown, green, yellow, &c.—the visitor should notice particularly one curious specimen of the globular or Egyptian jasper—a variety found near Cairo, and probably of organic origin. This specimen has a small piece chipped off from one end; and on the fractured surfaces both of the main piece and the chip there is to be seen a tolerably distinct likeness of the poet Chaucer, formed by the natural veining of the silex. The accidental fracture of a nodule of flint sometimes presents similar imaginary portraitures of known persons: flints have been found, exhibiting, when broken, likenesses of the Duke of Wellington, William IV., &c. the likeness being usually formed by the arrangement of the white veins or lines in the black substance of the flint. Of the opaline substances placed in the same case with the jaspers there are many varieties, the most remarkable of which is the noble or precious opal, a most beautiful bluish-green mineral, which owes its fine play of colours to a multiplicity of imperceptible fissures in its interior. After the diamond and Oriental ruby, the noble opal is the most valuable of precious stones, some Oriental opals having been purchased at double the price that would have been given for sapphires of the same size. The cat's-eye opal, so called from its peculiar changing pearly light, is usually accounted a variety of the noble opal; it is found in Ceylon, and is a very favourite stone with jewellers and virtuosi. In 1820 a cat's-eye stone, about two inches broad, was sold for £400. All these precious minerals, it is to be repeated—the opal, the carnelian, the agate, the jasper, the bloodstone, &c.—are but modifications of ordinary silex or silica. But even the commoner forms of this variable substance possess their value. Quartz enters largely into the composition of granite and other important rocks; many of the sandstones used for building consist merely of sand or silex-grains held together by clayey cement; sea-sand itself is used in the manufacture of glass, and for many other purposes; pounded flint is an ingredient in porcelain, flint-glass, &c.; and of rock-crystal we make lenses for spectacles, and many articles of ornament. But to obtain an idĕa of the important part which silex plays in the material economy of the globe, we must extend our view to those numberless other substances called *silicates*, in assisting to compose which, silex abandons its independent nature, and acts precisely as if it were an acid. In Cases XXV-XXXVII there is exhibited a very complete range of these silicates, or compounds of silex with other oxides more electro-positive than itself; Cases XXV-XXVI containing silicates with one base—that is, siliceous minerals formed by the combination of silex with a single oxide; and Cases XXVII-XXXVII, containing the more numerous silicates in which silex acts as an acid or two or more bases at once. Among the former are, in Case XXV, the silicate of lime, including such minerals as the table-spar or Wollastonite, from Mount Vesuvius, the *Okenite*, the *alumocalcite*, &c.; (Case XXV), the silicate of magnesia, including the *steatite*, or *soap rock*—a soft, yellowish-white, or greenish-gray mineral, of a greasy feel, found at Lizard Point in Cornwall, and at other places, and used in the manufacture of porcelain; the *keffekil* or genuine *meerschaum*—a light, yellowish-brown mineral, found in Natolia, and other parts of Turkey in Europe, and also in Spain, and celebrated as the substance out of which the bowls of the best German tobacco-pipes are made; the *lithimarge*, or *steinmark*, a soft substance used by carpenters, &c. for drawing marks on wood, stones, &c.; the *serpentine*, or chief magnesian rock, which assumes various forms, the purest constituting the noble serpentine, which has a fine greenish hue, &c. &c.; and assembled together in Case XXVI the silicates of zinc (*Smithsonite*), of manganese, of cerium (*cerite*), of iron (including many varieties), of copper (*siliceous malachite* or *copper green*), of bismuth (*bismuth-blende*), of zirconia (the common *zircon* and the *jacinth* of jewellers), of thoria (*thorite*, a Norwegian mineral, from which Berzelius first elicited the new metal thorium); and of alumina (comprehending among various other minerals the *catlinite*, or red pipe-stone of the North American Indians, mentioned under the head of the Ethnographic Room, and the *agalmatolite*, a stone of which the Chinese carve images, &c.) The silicates with several bases (Cases XXVII-XXXVII), the exact chemical composition of many of which remains yet undetermined, are arranged approximately as follows:—Cases XXVII-XXIX contain zeolitic substances, or minerals which intumesce a bubble under the blowpipe, such as the *Comptonite*, the *Thomsonite*, the *analcime*, the *needle-stone*, &c. the *prehnite*, of which there is a beautiful grass-green variety found in South Africa, and sometimes mistaken for the chrysoprase or the emerald; and the famous *jade* or *you-stone* of the Chinese, a glassy-looking substance, of a leek-green colour, which is wrought into figures, vessels, &c. and is highly esteemed in China. One of the greatest rarities in the museum is a finely-sculptured tortoise of jade, placed on a marble table on the floor; it was found on the banks of the Jumne, near Jellalabad, in Hindoostan. Cases XXX and XXXI are occupied by feldspathic substances, such as *common feldspar* in all its varieties; *Labrador* or *opalescent feldspar*, which, when cut and polished, exhibits a beautiful play of colours; *adularia*, or *naker feldspar*, one variety of which is the *moonstone;* and several others. Case XXXII contains micaceous and talcose substances, including many varieties of the well-known mineral mica, or sheep-silver, which is sometimes found in large sheets, and which, in combination with quartz and feldspar, forms granite; and many varieties of talc—an extremely soft, soapy mineral, used by carpenters, tailors, &c. for marking, and also as an ingredient in rouge for the toilet. Case

XXXIII contains specimens of *basalt*, *hornblende*, and related substances. Case XXXIV contains numerous varieties of the celebrated *asbestos* or *amianthus*—a mineral of shining appearance and fibrous structure, of the looser and silky kinds of which the ancients used to make an incombustible cloth for wrapping round dead bodies on the funeral pile, so as to prevent their ashes from mingling with those of the fire. Several pieces of such antique cloth are exhibited in the case beside the specimens of the native amianthus, from which it was manufactured. Among the compound silicates in Case XXXV are various beautiful crystals, called *Vesuvian gems*, ejected from Mount Vesuvius; Case XXXVI is devoted to the numerous varieties of the *garnet tribe*, and contains some specimens of great value and beauty; and in the first half of Case XXXVII are associated the varieties of the *beryl* or *emerald*, under their proper scientific denomination, as compound silicates of glucina and alumina.

Oxide of Titanium and Titanates (part of Case XXXVII).—To the former belong the *rutile* or *titan-shorl* from Moutier near Mont Blanc, and the *anatase*, a crystallised mineral found in Dauphiny. Among the titanates are the *sphene*, a silico-titanate of lime; the *pyrochlore*, a titanate of lime combined with titanate of oxide of uranium; the *ærstedtite*, a combination of oxide of titanium with lime, zirconia, magnesia, and iron oxide; and several other rare minerals.

Vanadates, Tungstates, and Tantalates (all contained in Case XXXVIII).—The chief mineral of the first of these groups is the *Johnstonite*, found at Wanlockhead in Scotland, and ascertained by its discoverer, Mr Johnston, to be a vanadate of lead. Among the tungstates, or combinations of the oxide of tungstenum, are the *schedite*, also called *tungsten* (heavy-stone), a tungstate of lime; the wolfram, a joint tungstate of iron and manganese, &c. Among the tantalates is a very interesting specimen of an American mineral, sent by Governor Winthrop to Sir Hans Sloane in the early part of last century, when it received the name of *Columbite.* It was in examining this mineral in 1801 that Mr Hatchett discovered the new metal which he named Columbium. The same metal, however, having been discovered about the same time by a continental chemist in another mineral, became known on the continent under the name of tantalum; and this name has now superseded the other.

Borates, Chromates, and Molybdates (Case XXXIX).—The minerals belonging to these groups are few in number; but some of them are of considerable value in the arts, particularly the borate of soda, known popularly by the name of *borax*, and the chromates of iron and lead. Borax, until recently, was brought, under the name of *tincal*, in dirty crystalline masses, from Thibet, Persia, Ceylon, and South America; in all which countries it was found dissolved in the waters or incrusted on the banks of certain lakes. Since 1816, however, it has been procured more abundantly and more economically in Tuscany, where its principal ingredient is found deposited in the form of impure boracic acid, in lagoons or hollows in the sides of the hills. About 800 tons of boracic acid, at £45 or thereby a ton, and 250 tons of tincal, at about £2 a ton, are annually imported into Britain, where both are purified and converted artificially into borax, for home consumption or re-exportation. Borax is employed by braziers, silversmiths, &c. as a flux—that is, as a substance facilitating the fusion of other substances: chemists use it for a similar purpose; it is an ingredient in the glaze for porcelain, pottery, &c.; and it is also used medicinally. The two chromates that have been mentioned are used—the chromate of lead, or red-lead ore (an orange-red crystal), as a pigment; and the chromate of iron (a dark crystal of metallic appearance) as a source whence calico-printers obtain artificially the chromate of potash. The oxide of chromium itself is used as a colouring substance.

Borates containing Silicates (Case XL).—In this peculiar group are included the two mineral species *tourmaline* and *axinite*. Of the former there are several varieties—blue, green, red, black, &c.; the blue variety receiving the name of *indicolite*, and the red or Siberian variety that of *rubellite*. The primary crystalline form of tourmaline is a rhomboid; its lustre is vitreous; occasionally it is transparent, but more frequently translucent or opaque. The transparent varieties of tourmaline become electric when heated. In this case there is a splendid specimen of rubellite of unusual form and dimensions, presented by the king of Ava to the late Colonel Symes when he was on a mission to that country.

Carbonates (Cases XLI-LI, including the two supplemental Cases XLV A and XLV B).—This, it will be observed, is the most extensive order of minerals after the silicates; a circumstance which will seem perfectly natural, when it is recollected how plentifully carbonic acid is evolved in nature (by respiration, by combustion, and by a hundred other processes), and what a strong affinity this acid displays for various oxides. The chief carbonates, taken in the order in which they follow in the cases under notice, are—1. Carbonate of soda (Case XLI), which is plentifully found in many localities, and the uses of which as an ingredient in effervescing waters, a medicine, &c. are well known; 2. Carbonate of baryta or *witherite* (Case XLI), a poisonous salt, of which there are some beautiful specimens, including a variety from Cumberland called *barytocalcite*, and containing lime; 3. Carbonate of strontia, or *strontianite* (Case XLI), one of the only two forms (the other being the sulphate) in which strontia is found native. The carbonate is found chiefly at Strontian in Argyleshire, whence the name of the mineral; the sulphate is found near Bristol. Neither is of any use in the arts in its native state; but from the carbonate there is artificially prepared another salt—the nitrate, which is employed in fireworks, &c. to produce a brilliant red flame; 4. Carbonate of lime or *calcite* (Cases XLI-XLVI). This is by far the most widely-diffused of the carbonates, including as it does all varieties of what is popularly called limestone. An easy way to decide whether a mineral is a carbonate of lime or not, is to touch its surface with muriatic or nitric acid, when, if it is a limestone, it will effervesce. Among the most important varieties of limestone or calcite may be mentioned, *first*, the crystallised variety, which includes the various kinds of calcareous spar, stalactitic deposits, deposits from calcareous springs, &c. as well as the beautiful mineral called the *Arragonite; secondly*, the granular variety, in which the concretions are less distinct and regular, including all the *marbles;* and *thirdly*, the earthy or still farther comminuted variety, including all kinds of *chalk.* These varieties are well represented in the cases under notice. Cases XLII-XLV are set apart for the crystalline limestones, or calcareous spars, &c., and contain many beautiful specimens illustrating the differences presented by these minerals as regards form, colour, cleavage, capability of transmitting or refracting light, &c. In Cases XLI and XLII are placed by themselves numerous specimens of Arragonite from different localities; some of the pure alabaster-looking sort, used by the sculptor for vases, &c.; others, coloured by the presence of metallic oxides; others containing a tinge of carbonate of strontia, &c. In Cases XLV A and XLV B are exhibited polished specimens of all the principal known marbles. 'Marble,' it ought to be remembered, 'is but a technical name for any species of granular limestone sufficiently pure and compact to be susceptible of a fine polished surface. No matter what the colour, whether white or black—whether studded with the strange forms of fossils, or streaked with the most fantastic veinings—marble is but a carbonate of lime containing certain impurities. Most countries of any extent have varieties of native marbles, which, though inferior to those of Italy and the Greek Archipelago, might be still more extensively used than they are, were it not for the expense of cutting and polishing them, and, above all, for the rapidity with which many of them become weathered and tarnished. Sculptors and architects arrange the marbles of a country into such divisions as the following: *unicoloured*, such as the pure black, or the pure white; *variegated*, when marked with irregular spots and vei *madreporic*, when studded with encrinal and coral markings; *shell*, when only a few shells are interspersed through the mass; *lumachelli*, composed entirely of shells; *cipolin*, containing veins of greenish talc; *breccia*, formed of angular fragments of different composition and colour; and *puddingstone*, when the fragments are round instead of angular. The celebrated marbles of Greece and Rome, such as the Parian, the Carrara, &c. were of one uniform colour, and only occasionally marked with grayish or greenish veins. Besides these, which were employed chiefly in sculpture, the ancients used various fancy marbles for minor ornamental purposes—as black, red, green, yellow, spotted, and veined. The localities of some of these ancient marbles are lost, but inexhaustible supplies of first-rate statuary and architectural marble can still be obtained from the Greek Archipelago, from Carrara, Genoa, and other parts of Italy, and from Corsica and Sicily.' The value of the marble, as exported from these quarries, depends on the size of the block. Large blocks of good marble range from £2 to £3 per cubic foot; and blocks are sometimes obtained of more than 200 cubic feet. 'Many marbles of excellent quality are found in France; in England they are abundant in the counties of Derby, Devon, and Anglesea, the last being of a green colour; in Scotland, at Assynt, Ballachulish, and in the islands of Tyree, Skye, and Jura; and in Ireland, at Kilkenny, and other places. In the United States there are also excellent native marbles.' Specimens of all these various marbles are to be seen in the cases that have been mentioned; perhaps the most curious and interesting is a specimen of the Corinthian lumachelli or fire-marble, so called from a singular burnish that seems to flit under its polished surface. The remaining case of the series (Case XLVI) is devoted to specimens of chalk, marl, and other recent limestones. The uses of chalk as a manure, as an ingredient in cement, &c. are too well known to require mention. Triturated and purified, it forms *whiting* or *Spanish white*. There is one important purpose to which all the varieties of carbonate of lime may be applied, although, for economical reasons, only the more common limestones are used for it: this is the manufacture or production of lime; the uniform way of effecting which is to roast the broken limestone in a kiln, so as to drive out the carbonic acid. As it comes from the kiln, the lime is called *shell* or *unslacked* lime; but when moistened with water, it falls down in powder, and becomes *quicklime*—a substance largely employed in many industrial processes, as in glass-making, tanning, dyeing, bleaching, the manufacture of mortar and cement; also in agriculture, medicine, &c. 5. Carbonate of magnesia (Case XLVII), under which denomination are comprehended the pure carbonate of magnesia or *magnesite*, and the common magnesian limestone or *dolomite*, which consists partly of carbonate of lime and partly of carbonate of magnesia. Magnesian limestone, which is found extensively in England and other countries, is usually of a cream-yellow colour; some varieties are soft, and easily weathered; others are durable, and make a good building material. The new Houses of Parliament are built of magnesian limestone from a celebrated Derbyshire quarry, this material having been carefully selected by a commission of inquiry appointed for the purpose. Some very compact varieties of this limestone found in Germany and elsewhere are used for lithographic purposes. 6. Carbonate of iron, or *iron-spar* in different forms (Case XLVIII). 7. Carbonate of manganese, or *manganese-spar* (Case XLVIII). 8. Carbonate of zinc, or *zinc-spar*, also called *calamine* (Case XLIX), are of the ores from which metallic zinc is sometimes extracted. 8. Carbonate of lead, or *lead-spar*, called also *white-lead ore* (Case XLIX), in different varieties, from Cornwall, from the Hartz Mountains, from Siberia, &c. 9. Carbonate of copper (Cases L-LI): *first*, the blue carbonate, called *blue copper* or *copper azure*, some varieties of which yield the pigment called mountain-blue; and *secondly*, the green carbonate or *malachite*. 10. Carbonate of cerium or *carbocerite*, from Bastnaes in Sweden (Case LI). 11. Carbonate of bismuth, sometimes called *bismuthite* (Case LI).

Nitrates (part of Case LII).—These form but a very small class of mineral substances; the only nitrates of any importance that are found native being the nitrate of potash, or *saltpetre*, and the nitrate of soda, called also *cubic nitre*. The nitrate of potash, or saltpetre, is used extensively in the manufacture of gunpowder, in dyeing, in medicine, in curing meat, &c. It is found native as an efflorescence, or crystalline crust in the soil, in different parts of the world. Among the specimens in the case are some from Italy, and others from Spain; but the saltpetre of commerce is chiefly derived from Bengal, whence about 10,000 tons of the rough salt are annually imported into Britain, to be purified for use. In France, Germany, and other countries, the salt is produced artificially. The nitrate of soda is obtained almost entirely from South America, a great proportion of the southern regions of that continent consisting, according to Darwin, ' of *salinas*, or salt plains, from which common salt and the sulphates and nitrates of soda might be procured in any quantities—these occurring sometimes as an efflorescence, sometimes in crystallised strata, but oftener mingled with clay, sand, and other earthy impurities. One deposit which he visited in 1835 was full 3300 feet above the level of the Pacific, and consisted of a hard stratum, between two and three feet thick, of the nitrate mingled with the sulphate of soda, and a good deal of common salt. It lay close beneath the surface, and followed for a length of 150 miles the margin of a grand basin or plain, which, from its outline, must once have been a lake, or more probably an inland arm of the sea, as iodic salts (salts formed by the combination of oxide of iodine with the metallic oxides) were abundant in the stratum. The salt was first imported from Iquique in 1830; and so rapidly has its commercial value increased, that ten years after, 150,000 hundredweight were shipped for Great Britain alone. In 1835 the selling price at Iquique was 14s. per 100 pounds.' The crystal of this nitrate is shaped differently from that of the nitrate of potash, being of a rhomboidal form, while the other is a six-sided prism. It is used as a manure, especially on wet soils; it is also used in the manufacture of nitric acid, and for many other of the purposes for which saltpetre is employed. As it deliquesces rapidly, it cannot, however, be substituted for saltpetre in the manufacture of gunpowder.

Sulphates (part of Case LII and Cases LIII, LIV, and LV).—These compose a far more numerous group than the nitrates. Enumerated in the order in which they follow each other, the principal sulphates in the cases under notice are—1. Sulphate of soda, or *Glauber salt* (Case LII), well known as a purgative medicine, and found native in various situations. 2. Sulphate of baryta, called also *baroselenite*, or *heavy-spar* (Cases LII, LIII). This mineral occurs in many places; the finest of the specimens under notice are from Hungary, the Hartz Mountains, Piedmont, and Cumberland. Among the varieties is a fetid baroselenite called *hepalite*, composed of the sulphate and foreign bituminous matter. In Derbyshire there is a variety called provincially *cawk*. Heavy-spar is largely used by dishonest dealers in the adulteration of white lead. 3. Sulphate of strontia (Case LIII), to which reference has been already made: the collection of varieties of this salt is very fine. 4. Sulphate of lime, or *gypsum*, in its numerous varieties (Case LIV), as the splendid crystallised gypsum or *selenite* (of which there is a magnificent mass on a table near Case LIV, found near Reinhardsbrunn in Saxe-Coburg, and presented to the museum by Prince Albert); fibrous gypsum; granular gypsum, or *alabaster*; stalactitic gypsum; common earthy gypsum, &c. One or other of these varieties of gypsum is found in most countries. Gypsum abounds in various parts of England, and it is extensively quarried in the neighbourhood of Paris—hence its common name Plaster of Paris. When calcined, reduced to powder, and mingled with water, it forms the valuable paste called *stucco*, which is used for so many purposes. It is also employed as a manure, as an ingredient in mortar, &c. The granular variety of it, called alabaster, is admirably adapted for the purposes of ornamental sculpture, being soft enough to be easily worked by the turning lathe, and at the same time capable of the most pure and beautiful polish. Unfortunately, however, it is soon tarnished by exposure, and hence all alabaster ornaments—such as statues, vases, lamps, watch-stands, &c.—ought to be kept under glass-cases. Good alabaster is found in Derbyshire and Staffordshire, but the best is that of Volterra in Tuscany. 5. Sulphate of magnesia, called also *Epsomite*, or *Epsom salts* (Case LV), found native in some mineral springs, as, for example, those of Epsom in Surrey, and also produced artificially from magnesian limestone. 6, 7, 8, and 9, The sulphates of zinc, iron, copper, and lead (Case LV), known respectively as *white vitriol*, *green vitriol*, *copper vitriol*, and *lead vitriol*, found in different localities, and all used in the arts. 10. Sulphate of uranium-oxide; a very rare mineral called *johannite*. 11. Sulphate of alumina, or *alum*, in all its varieties. Alum is found native only in few places, and very small quantities, and hence, as it is a substance in great demand, being used in calico-printing, dyeing, leather-dressing, candle-making, paper-making, &c. it is produced artificially on a large scale wherever there are argillaceous or clayey strata capable of yielding it. At Campsie, near Glasgow, it is made from certain coal-shales; in Yorkshire alum slate is used; and in France it is made by mixing clay, potash, and sulphuric acid. In all common alum there is a little potash, but as this ingredient serves no useful purpose, a patent alum has recently been invented, which is made entirely from sulphuric acid and pure Cornish clay, without the addition of any potash. This alum has not a crystalline, but an opaque earthy form. Alum is manufactured extensively in China, and Chinese alum is the kind chiefly used in India. Besides the simple sulphates that have been enumerated, there are in the same cases various mineral sulphates of a more complex constitution. Among these may be mentioned the celebrated *lazulite*, or *lapis-lazuli* (a joint sulphate and silicate of alumina), found in China, Siberia, &c.; at one time considered precious on its own account, and also as the scource whence the valuable blue pigment called *ultra-marine* was obtained. Some varieties of the mineral are still used by the lapidary; but the pigment ultra-marine is now produced artificially by a process so cheap, that as much may be purchased for a sixpence as would formerly have cost a pound.

Arsenious Acid and Arseniates (Case LVI).—The former, called also *arsenic bloom*, is a white octohedral crystal, rarely found native, but often produced artificially in mines. Among the latter are the *arseniate of lime*, or *pharmacolite*, easily confounded with arsenious acid; arseniate of iron, or *pharmacosiderite;* arseniate of copper; arseniate of cobalt; arseniate of nickel, &c. These are chiefly valuable as containing arsenic.

Phosphates (Case LVII and part of Cases LVII A and B).—Among the minerals of this peculiar class, produced by the combination of the oxide of phosphorus with the metallic oxides, may be enumerated the phosphates of iron, of lead, of manganese, of copper, of uranium-oxide, of yttria, of magnesia, of lime (phosphate of lime is an ingredient of bones), of alumina, &c.; all of which constitute distinct species, each including several varieties. The most remarkable of all the simple phosphates is that variety of the phosphate of alumina called the *calaite* or *turquois*. The real *turquois* (called in Persian *firuzah*), 'is an opaque gem found chiefly at Nishapur, in the province of Khorasan, Persia, in nodules or as small veins traversing a ferrugino-argillaceous rock, and is greatly esteemed on account of its beautiful blue colour, which will in most cases be sufficient to distinguish it both from the silicate of copper, and from fossil bones and teeth impregnated with blue phosphate of iron or carbonate of copper, some of which substances are vulgarly called occidental turquoises.'

Fluorides (Case LVIII, and the supplemental Case LVIII A).—In the former case are contained numerous specimens of the well-known fluoride of calcium, called also fluate of lime, or *fluor-spar;* specimens of the rare fluoride of aluminium found in Cornwall, and named *fluellite;* and specimens of compound fluorides of calcium, yttrium, cerium, &c. In the supplemental case are contained such minerals as consist of fluorides in combination with silicates, the most important of which is the *topaz*. A series of specimens of this precious and beautiful mineral is exhibited, including varieties from Saxony, Siberia, and Brazil.

Chlorides (Case LIX).—Enumerated in their order, the following are the chief mineral substances of this group:—1. Chloride of sodium, called also muriate of soda, or *common salt*. This important substance exists abundantly in sea-water, constituting more than a thirtieth part of its weight; it is discharged by salt or brine springs; and it is found in various degrees of purity in beds and irregular masses from 20 or 30 to more than 120 feet in thickness. Until recently, the common salt of commerce was derived from sea-water by a very simple process of evaporation and purification, and this plan is still pursued in countries where the arts of life are not far advanced; but in Great Britain and other civilised countries, the necessary supply is now obtained exclusively from brine springs and salt mines. The chief brine springs in England are those of Droitwich in Worcestershire; the most important salt mines (the salt obtained from which is called rock-salt) are situated in Cheshire and Worcestershire. There are also valuable mines at Altemonte in Calabria, at Halle in the Tyrol, at Cardona in the Pyrenees, at Wieliczka in Poland, in Mexico, &c. Specimens from these various mines, exhibiting the different forms and colours that the salt assumes, are to be seen in the case under notice. 'The appearance of rock-salt in the mine,' says Professor Ansted, 'is by no means of that brilliant character, nor has it the delicate transparency and bright reflecting surface, that the reader may suppose characteristic of it. It is usually of a dull red tint, and associated with red and palish green marl; but it is still not without many features of great interest; and when lighted up with numerous candles, the vast subterranean halls that have been excavated present an appearance richly repaying any trouble that may have been incurred in visiting them. At Nantwich, and the other places in Cheshire where the salt is worked, the beds containing it are at a depth of from 50 to 150 yards below the surface. The method of working the thick beds is not much unlike that of mining the thicker seams of coal. The roof, however, being more tough, and not so liable to fall, and the noxious gases, with the exception of carbonic acid, totally absent, the works are more simple, and far more pleasant to visit. Large pillars of various dimensions are left to support the roof at irregular intervals, and the intervening portions are loosened by blasting.' To prepare the masses of rock-salt for use, they are first dissolved in water, and the solution is then purified and crystallised. The uses of common salt are too well known to require mention. Besides its utility by itself, it is the source whence we obtain the important substance soda with the greatest ease. In some parts of Central Africa it is so valuable, that slabs of it are used as bullion by the negroes. 2. Chloride of ammonium, called also muriate of ammonia, or *sal-ammoniac*. The rare native specimens of this salt are from Vesuvius, St Etienne, &c. The sal-ammoniac of commerce was formerly procured from the soot of camels' dung, but it is now largely manufactured by the artificial combination of muriatic acid with decaying animal matter, or other substances containing ammonia. The salt is colourless, and crystallises in a cubical form. It has a sharp saline taste, but no smell, and dissolves readily in water. It is largely used by the chemist, both independently, and as a material from which to obtain ammoniacal gas, and the well-known sesquicarbonate of ammonia called smelling-salts. 3. Chlorides of lead, including a very rare murio-carbonate of lead from Derbyshire. 4. Chloride of copper, or *atacamite*, found native in Chili in splendid crystalline forms. 5. Chloride of silver, called also *horn silver*, found in Chili. 6. Chloride of mercury, or *horn quicksilver*.

CASES LX AND LX A, CONTAINING ORGANICO-CHEMICAL SUBSTANCES, OR MINERAL SUBSTANCES COMPOSED AFTER THE MANNER OF ORGANIC BODIES, FROM WHICH THEY DERIVE THEIR ORIGIN.—This class of substances, which Berzelius places as an appendix to the true mineral kingdom, corresponds pretty nearly to the 'bituminous substances' of the earlier mineralogists. It includes these four descriptions of minerals—organico-chemical salts, resins, bitumens, and coal.

Organico-Chemical Salts.—Under this denomination are included three peculiar minerals, of which specimens are exhibited in the cases under notice:—1. Mellate of alumina, called also *mellite*, or *honey-stone*. This mineral is found only at Artern in Thuringia, imbedded sometimes in nodules, but at other times in grains or crystals in masses of brown coal. It has a resinous or vitreous lustre, and a deep honey-yellow, or orange-yellow colour; is translucent, and sometimes transparent. When strongly heated, it becomes opaque and black, and at last crumbles into powder. When analysed, it is found to consist of alumina, water, and a peculiar acid of a sour bitter taste, named by its discoverer, Klaproth, mellic or mellitic acid. 2. Oxalate of iron, formerly known as *resinous iron*, but now called *Humboldtine*, or *oxalite*. This is a greenish-yellow mineral, of fine earthy structure; it is found either crystalline or in small flat masses. It is composed of protoxide of iron and oxalic acid—a peculiar and extremely poisonous acid, discovered by Scheele in 1776, and which forms an ingredient in the juice of many plants. 3. *Struvite*, a phosphate of magnesia and ammonia, discovered in 1845, when innumerable crystals of it were found on laying the foundation of a church at Hamburg.

Resins.—Of this class of minerals the most remarkable is *amber*, a well-known transparent or translucent yellow substance, found in various countries, but chiefly on the shores of the Adriatic, on the Baltic coast between Memel and Dantzic, where there are regular mines of it, and in Japan, Madagascar, and the Philippine Islands. It occurs usually in small masses bedded at a depth of about 100 feet from the surface in lignite or brown coal. The largest mass of amber known was found very near the surface of the ground at a place in Lithuania, about twelve miles from the Baltic; it weighed eighteen pounds, and is now in the royal cabinet at Berlin. Various theories have been held regarding the origin of amber, the most probable of which is, that it is the fossilised gum of ancient trees. This opinion is confirmed by the circumstance, that the deposits in which it is found always consist of lignite or fossilised wood. As gums, exuded in a liquid state from the tree, have foreign matters in many cases entangled with them, so as to be at last quite enclosed in the mass, so pieces of amber are frequently found containing insects, fragments of wood, drops of water, &c. Many specimens of this kind are exhibited in the case under notice. Amber being easily cut, and taking a beautiful polish, is used for beads, necklaces, and trinkets of various kinds. Dissolved in linseed-oil, it forms a peculiar varnish called amber-varnish. Amber was well known to the ancients; and the Phœnician traders were wont, at a very early period, to bring a supply from the Baltic to the Mediterranean market. The Greek name of the substance was *electron*, from which is derived the word *electricity;* the whole of this growing modern science being virtually but an expansion of the simple observation made by the ancients—that a piece of amber, when rubbed, attracted light substances to it, or, as we would now say, became electrical.

Bitumens.—To this class belong all the varieties of the substance called mineral pitch. In its most liquid state this substance is known as *naphtha*—a limpid and almost colourless fluid, of a strong bituminous odour, and highly inflammable, found on the Euphrates in Mesopotamia, on the shores of the Caspian, in the Birman empire, and also at Piacenza, Modena, and other places in the north of Italy, and in some parts of North America. In all these places it is found exuding or bubbling up from fissures in rocky strata, so that it is easily collected. It possesses the property of dissolving most of the essential oils and resins, and is largely employed as a solvent of caoutchouc by the makers of India-rubber cloth. It is also used as an oil in lamps, and the soot deposited by the flame of such lamps forms a very fine black pigment. *Petroleum*, or *rock-oil*, is to be regarded as but a thicker and less pure native form of naphtha, and indeed is often made use of as a source from which to obtain naphtha artificially. It is a liquid of brownish colour, and is found exuding from coal-strata in various parts of Europe, as well as in Persia, Birmah, Texas, Barbadoes, &c. Like naphtha, it serves as a lamp-oil; and in some countries an artificial fuel is made by working it up with earth, &c. On exposure to the air, it thickens and acquires a darker colour; it is then known as *mineral pitch*, or *Barbadoes tar*, and when still further exposed to the action of the air, &c. it forms the hard and solid substance called *asphalte*. Both mineral tar and asphalte are found near naphtha springs, being, in fact, nothing more than the accumulated produce of such springs; but the chief supplies are brought from the shores of the Dead Sea, from Barbadoes, and from one or two districts in France. They are used as cements, &c.; and an artificial asphalte made by mixing gravel or iron slag with the native material is now largely employed in roofing, paving, &c. *Jet* or *pitch coal* is but a purer and more compact form of the same fossil which, in its other modifications, we call naphtha, petroleum, tar, or asphalte. It is found in beds of lignite or brown coal in almost all places where amber occurs; and appears, in fact, to be but the bituminised wood of those trees of which amber is the fossilised gum. It is of an extremely black colour, and susceptible of a fine polish; and as it is easily cut and turned, it is much used for beads, figures, and other ornaments. Imitations of jet are common; but the genuine article may be readily detected by its lightness. Specimens of all the above-named varieties of mineral pitch are to be seen in the case under notice, together with some other bitumens, such as the *elaterite*, or elastic bitumen of Derbyshire and Fifeshire; the *dàpeche*, an inflammable fossil substance, not unlike India-rubber, found by Humboldt in South America; the *hatchetine*, a bitumen found in South Wales; the *scheererite*, the *hartite*, &c.

Coal.—Of this important mineral, with which it so happens that the classification comes to a close, only as many specimens are given as will illustrate the different varieties that it assumes. The most conspicuous of these are the *black coal* and the *brown coal* or *lignite*, both of which are nothing else than ancient vegetable matter which, having been amassed in peculiar circumstances at certain depths below the earth's surface, has in course of time lost its vegetable character, and become more or less fossilised. Were one of our forests suddenly overthrown, and buried under such a pressure of superincumbent material as would crush the trunks, branches, leaves, and underwood together during the process of decay, the result, after the lapse of a certain number of ages, would be a bed of coal. Peat-mosses are to be regarded, therefore, as illustrations of the first stage of the passage of vegetable matter into coal; brown coal or lignite, in which the forms of the component vegetables—the trunks, the branches, &c.—are still discernible, is an illustration of the same process a little farther advanced; and black coal exhibits the process completed. While, however, all geologists are agreed that coal is but the fossilised accumulation of vegetable matter, there are subordinate differences of opinion as to the manner in which such accumulations took place. Some contend that the component parts of the coal—the trees, the ferns, the grasses, &c.—grew up and accumulated in huge forests or jungles, as in some parts of the world at the present day, each year's growth adding a new supply of decaying matter to the soil; that thus peat-mosses were formed such as we now see; and that these peat-mosses became submerged and covered over with layers of sand, mud, &c. which, hardening into rock, shut down the vegetable matter, and compelled it, in the process of chemical alteration, to assume the form of coal. Others believe that coal-beds were originally jungles at the mouths of rivers into which miscellaneous masses of foreign matter, such as sand, mud, and vegetable substances, were drifted from higher lands, the whole at last becoming covered up. In whatever way coal was formed, one cannot but admire the care with which nature, in these rough processes that were going on in the early world, was storing up for its future inhabitants such wealth and abundance of a most necessary material. Ages ago, ere yet a man stood on the planet, its surface was clothed with vegetation; man then came, and the vegetation was covered up in the earth; and now at last, after some six thousand years, he has learned to dig it up again, and to use it as fuel for his fires, his furnaces, and his steam-engines. In Britain coal first began to be used for fuel in the twelfth century; and from that time the use of it has increased and extended, until now there is hardly a spot of the earth where coal is not dug for or imported. It is found more or less extensively in France, Spain, Belgium, Germany, India, China, the East Indies, Australia, New Zealand, the United States, Nova Scotia, Chili, Peru, Panama, and some of the Pacific Islands. In Britain the principal coal-fields are those of Northumberland and Durham, Lancashire, Stafford, and the Scottish Lowlands. From the various collieries or coal-mines in these districts about 30,000,000 tons of coals are at present annually raised, of which about 3,000,600 or 4,000,000 are exported to other countries, and the rest consumed within the island. Such an annual drain from the bowels of the earth must in course of time produce a sensible diminution in the quantity of coal in the island; but the supply of coal over the whole globe is so vast, that, the means of carriage remaining the same, there is no fear of a scarcity for ages to come. It is the black coal that is chiefly used for fuel, brown coal, or lignite, being less valuable. The principal kinds of black coal used in this country are thus distinguished—*caking coal*, such as is found at Newcastle, a highly bituminous sort, which emits much smoke, and cakes while burning; *cubic coal*, which is also bituminous, but does not cake; *splint* or *slate coal*, which is less bituminous, yields an intense heat, and leaves little ash; and *cannel coal*, a compact shining variety, which burns with a clear flame, and leaves a whitish ash. These varieties are found in different localities, are used for different purposes, and fetch different prices. All of them are easily to be distinguished from the anthracite or blind-coal (See *Carburets*), which is non-bituminous, has a semi-metallic lustre, and burns without smoke. Some compact varieties of cannel coal admit of being cut or turned; and in the museum there are to be seen busts of Henry VIII. and his daughter Lady Mary cut out of masses of this common native mineral.*

II.—Botanical Section.

This section comprises two rooms in the museum adjacent to the Mammalia Saloon; but as these rooms are not open to the public, owing to the peculiar nature of their contents—which are, for the most part, of a kind that would suffer from exposure—they are not mentioned in the catalogue, nor would a casual visitor to the museum be aware of their existence, or even of the fact that the museum contained a botanical section at all. Students of botany, however, or persons having any special object in view, are admitted to the Botanical Rooms on proper application being made to the authorities of the museum; and for the public in general such a brief account of their contents as we shall here give will doubtless be sufficient.

The first expressly botanical author among the ancients was Theophrastus, the pupil and successor (B.C. 324) of the great Aristotle. The total number of plants known and registered in his time was 500, which was probably as many as could be easily collected in any single locality in Greece. As plants were then sought purely with a view to their medicinal or horticultural uses, few additions were made to this list, and the entire number of which the ancients bequeathed a register to the moderns did not exceed 700. After the revival of natural science in the middle ages, the study of botany was prosecuted with ardour; and the area over which observers could extend their researches having been gradually enlarged, the result since that time has been a wonderful extension of the botanical catalogue. The successive stages of this result are presented by a recent French author, in a very instructive form, as follows:—

Lonicer	in 1546	enumerated	879	plants.
Lobel	in 1570	...	2,191	...
Dalechamp	in 1587	...	2,751	...
Gaspard Bauhin	in 1596	...	6,000	...
Tournefort	in 1694	...	10,146	...
Ray	in 1704	...	18,655	...
Linnæus	in 1762	...	8,551	species; the apparent decrease arising from the reduction which Linnæus's system of classification

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* In connection with the subject of this section, see essay of Berzelius entitled 'Attempt to Establish a new System of Mineralogy,' translated from the Swedish under the superintendence of Dr Thomson of Glasgow in 1814; the same essay in French, enlarged and published by Berzelius himself some years later; also 'Phillips's Mineralogy,' 'Jameson's Mineralogy,' treatise on *Mineralogy* in the 'Encyclopædia Metropolitana,' and sheets on *Mining and Metallurgy* in 'Chambers's Information for the People.'

effected in the number of species, notwithstanding that the whole number of individual plants known had enormously increased.

Persoon in his 'Synopsis Plantarum,' published in 1805-7, enumerated	26,000 species.
Steudel, in the first edition of his 'Nomenclator Botanicus,' published in 1824,	50,649 ...
Steudel, in second edition of do., 1841, about,	88,000 ...
Total number known to botanists in 1845,	95,000 ...

Arguing from the law of increase exhibited in this table, in connection with the estimated extent of the earth's surface that remains yet to be botanically explored, an attempt has been made to arrive at an approximate conclusion as to the total number of vegetable species existing on the globe. Some limit the number to 150,000, others raise it as high as 300,000, but any such supposition can be at best but a guess. The time, however, may not be far distant when every existing species of the vegetable kingdom shall be accurately known and registered; so that on whatever spot of the earth's surface a botanist lives, he shall have the means of becoming acquainted with the vegetation of the whole.

The obvious mode of classifying plants, or any other substances requiring classification, is to arrange them so that all those most resembling each other shall be placed together. This, properly considered, is the essential and only principle of classification, and logicians have taken care to furnish a set of terms corresponding with it. Thus the word *class* is the strict scientific denomination for a number of substances resembling each other in certain broad leading features; the term *order* is employed to include such as are still more closely allied; a *genus* consists of those resembling each other in a still greater number of particulars; and a *species* defines a still closer type or resemblance, slight deviations from which are designated *varieties*.

All botanists have followed this general principle of classification, and have adopted, with certain modifications, the logical terms consecrated to it; but they have differed materially from each other *as regards the precise parts or properties of plants in which we should seek for their mutual likenesses*. Thus it would be possible to found a classification on the mere circumstance of the colour of the flowers of plants; classing all the blue-flowered plants, all the white-flowered plants, all the red-flowered plants, &c. together. But such a classification would obviously be clumsy in the extreme—plants that are closely allied, or almost identical, often having flowers of different colours. In a similar manner, any attempt to classify plants by any other single peculiarity in their aspect would be found useless. The business of the botanist is to find out, if possible, *what peculiarity of the structure of a plant, or what assemblage of properties in it, is the essential thing in the* *constitution of that plant*—what peculiarity of structure, for example, or what assemblage of properties in a rose constitutes it a rose—and on this discovery to found his classification.

The early botanists were content to classify plants according to their more obvious resemblances, and it was not till near the beginning of the eighteenth century that a scientific system was attempted. In 1694 the French botanist Tournefort proposed a classification founded chiefly on differences in the corolla or flower-part of the plant; and about the same time our countryman, Dr John Ray, a man of great capacity, and who did more for the progress of natural science than almost any other man of his age, originated two most important botanical ideas—that of the division of all plants into FLOWERING and FLOWERLESS plants; and that of the distinction of flowering plants into the two great denominations of *monocotyledons*, or such as have one cotyledon or seed-lobe —as, for instance, the cocoa-tree; and *dicotyledons*, or such as have two cotyledons or seed-lobes—as, for instance, the oak or beech. But the labours of both these naturalists were superseded by those of the celebrated Swede, Carl Von Linné, more commonly known by his Latinised name of Linnæus. Born in 1707, he began the study of the natural sciences about his twentieth year, and from that period till his death in 1778 his whole attention was devoted to them. Amassing and revising all the knowledge that his predecessors had collected, and enlarging it by his own observations, he also succeeded in establishing many radical changes in the mode of prosecuting the various branches of natural history, especially botany. Of the system which he proposed for the classification of plants—a system usually called the Linnæan, but sometimes also the Sexual or Artificial System of Classification—the following is a brief outline:—

Plants reproduce themselves or propagate their species by certain organs adapted for the purpose. In the vast majority of plants these organs assume the form of flowers, and constitute a conspicuous portion of the general development of the plant; in some plants, however—as in ferns, mosses, lichens, sea-weeds, &c.—the reproductive agency is of a different kind, and has no such manifestation. Hence the first great division of the vegetable kingdom is into flowering plants, called also *phanerogamous*—that is, openly-marrying plants; and flowerless plants, called also *cryptogamous*—that is, secretly-marrying plants. Of the 8551 species of plants that composed the entire botanical catalogue of Linnæus, 7728 were phanerogamous, and only 825 cryptogamous. In order farther to classify the former, he went on to observe the differences that were discernible in their respective flowers. The flower of a plant usually consists of several distinct parts—the calyx, or leafy cup in which the blossom rests; the corolla, or true blossom, often gaily coloured, and separated into divisions called *petals;* the disk, a fleshy circle at the bottom of the corolla within the petals; one or more stamens, which consist usually of small filaments or threads shooting up within the flower, outside the disk, and close to the base of the petals, and poising at their top a minute membraneous sac termed the *anther*, containing a dust called the *pollen;* and one or more pistils, that is, filaments of different construction from the stamens, growing up within the disk from the centre of the corolla, and consisting of three parts—the *stigma* or top, the *style* or tubular stalk in the middle, and the *ovary* or seed vessel at the bottom. Now of all these parts of the flower, Linnæus selected the stamens and the pistils as the most important for the purposes of classification. The former, it has been distinctly ascertained, are the male organs, and the latter the female organs of the plant; and the two together constitute the most essential portions of the flower, the remaining parts being, as it were, adjuncts. Observing, therefore, the differences in the number, size, and arrangement of the stamens and pistils in the flowers of different plants, and employing Greek terms to describe these differences, Linnæus arranged all known phanerogamous plants into twenty-three classes, each class containing several orders. Thus all plants having flowers with only one stamen were placed in the class *Monandria* (*monos*, one or single; and *aner*, a man or male); and this class was divided into two orders—namely, Monandria *Monogynia*, including such as, having one stamen, had also but one pistil (*monos*, one or single; and *gyné*, a woman or female); and Monandria *Digynia*, including such as, having one stamen, had two pistils. In a similar manner plants having two, three, four, five, six, seven, eight, nine, and ten stamens were constituted into classes, with the names respectively of *Diandria*, *Triandria*, *Tetrandria*, *Pentandria*, *Hexandria*, *Heptandria*, *Octandria*, *Enneandria*, and *Decandria;* each subdivided into orders—Monogynia, Digynia, Trigynia, &c. according to the number of pistils. Other denominations, borrowed on the same principle from the Greek, were employed for the remaining classes. Thus the class *Gynandria* included all plants having the stamens (*andres*) growing on the pistil (*gyné*); the class *Monœcia* (*monos*, one or single; and *oikos* or *œcus*, a household) all plants having the stamens on one flower and the pistils in another; and so on. To the twenty-three classes of phanerogamous plants was annexed as a single or twenty-fourth class the cryptogamous plants, subdivided by Linnæus into four orders—the *Filices* or ferns, the *Musci* or mosses, the *Fungi* or mushrooms, and the *Algæ* or sea-weeds. The total number of *orders* in the Linnæan system was 109.

This system, although it served admirably at the time when it was propounded as an artificial means of classifying the 7000 or 8000 plants that were known, has since become inadequate; and although many able botanical works are founded on it, it is now all but universally abandoned. Indeed Linnæus himself assigned it no greater value than that of a provisional method of great convenience. The system that has superseded it is called the Natural System, and was founded by Antoine Laurent de Jussieu, a French botanist, who was born in 1748, and died so late as 1836. The principle of this system, to borrow the language of Dr Lindley, is, 'that all points of resemblance between the various parts, properties, and qualities of plants be taken into consideration;' in other words, instead of confining his view, as Linnæus did, to the number and arrangement of the stamens and pistils of plants, Jussieu took into account also all circumstances whatever pertaining to the corolla, the calyx, or any other part of a plant. Such a system might not at first have a very simple aspect, but by compelling botanists to omit nothing in their examination and delineation of plants, it would have admirable results.

According to Jussieu, the dignity of a plant—that is, its degree of organisation—is to be discerned in the appearance of its seed or embryo; plants of the lowest organisation, such as ferns, mosses, fungi, &c. having no cotyledon or rudimentary leaf in their embryo; plants of higher organisation, such as grasses, lilies, palms, &c. having one cotyledon; and the most highly-organized plants, such as the splendid wide-branching forest-trees, having two cotyledons. Hence his first great division of the vegetable kingdom into ACOTYLEDONS, MONOCOTYLEDONS, and DICOTYLEDONS; the first corresponding with the cryptogamia of Linnæus, and the last two composing the phanerogamia. In this threefold division an important fact is also recognised relating to the differences in the manner of growth of different plants. Thus, acotyledonous plants, such as mosses, ferns, &c. are uniformly *acrogenous*—that is, they grow by increase at their tops or extreme points; monocotyledonous plants, such as palms, &c. are *endogenous*—that is, they grow by increase from within, or by swelling at the pith; and dicotyledonous plants, such as oaks, beeches, &c. are *exogenous*—that is, they grow by the addition of successive layers to the exterior of the stalk or trunk. Adopting, therefore, this great threefold division, as warranted and even indicated by nature, Jussieu went on, by attending, in the next place, to minuter differences—as, for instance, to differences in the form of the corolla, the position of the stamens, &c.—to subdivide plants into classes. The acotyledons, being comparatively few, he arranged in *one* class; the monocotyledons he divided into *three;* and out of the dicotyledons he made no fewer than *eleven* classes. These fifteen classes he again subdivided into orders, of which he reckoned about 100 in all; and the orders he divided into genera and species, each descent in the classification from a more general to a more special denomination being accompanied by a closer and more scrupulous consideration of the entire organism of the plant.

Jussieu's system has been much extended and improved since it was first propounded, and especially by M. Decandolle of Geneva. Botanists usually adopt at present some such classification as the following, in which the plants are arranged according as they rise in organization:—

DIVISION I.—FLOWERLESS OR CRYPTOGAMOUS PLANTS, CALLED ALSO ACROGENOUS, AND SOMETIMES ACOTYLEDONOUS PLANTS; comprehending in all (according to an estimate in February 1844) twenty-seven orders. In this division are comprised two important subdivisions—namely, Subdivision I. CELLULARES, including all such flowerless plants as are composed solely of cellular tissue—that is, of soft pulpy matter analogous to the fleshy parts of animals; as, for example, mushrooms. Subdivision II. VASCULARES, or flowerless plants, exhibiting a higher kind of structure, with vessels, ducts, &c. discernible in the substance of the plant.

DIVISION II.—FLOWERING OR PHANEROGAMOUS PLANTS; comprehending (in February 1844) 269 orders, and subdivided as follows:—Subdivision I. MONOCOTYLEDONS, OR ENDOGENOUS FLOWERING PLANTS, comprehending two classes. Class 1st, *Glumaceæ* (including all the grasses), or such as have their stamens and pistils enveloped not in a flower or perianth, but in a mere glume or husk, like an ear of corn. Class 2d, *Petaloideæ*, or such as have their stamens and pistils enveloped in a perianth or petaled flower—as, for example, a lily. Subdivision II. DICOTYLEDONS OR EXOGENOUS FLOWERING PLANTS, comprehending two classes. Class 1st, *Monochlamydeæ*, or such as have their stamens and pistils guarded only by one floral envelop, which is then called a calyx, as in the evergreen. Class 2d, *Dichlamydeæ*, or such as have a separate calyx and corolla. In this class there are reckoned three sub classes—1st, Corollifloræ, or such as, like the acanthus, have the stamens and pistils inserted in the petals of the corolla; 2d, Calycifloræ, or such as, like the acacias, have the stamens and pistils inserted in the calyx; and 3d, Thalamifloræ, or such as, like the vine, have the stamens and pistils growing from the receptacle.

According to this mode of classification, the entire number of known vegetable orders in February 1844 was 296; but some botanists do not make the orders nearly so numerous. The subdivision of the orders into genera and species at the same date, gave 7500 as the total number of known genera, and 95,000 as the total number of known species, of which the following was the approximate distribution:—

		Genera.	*Species.*
Cryptogamous Plants,	Cellulares,	463	10,500
	Vasculares,	332	4,500
Phanerogamous Plants,	Monocotyledons,	1,232	15,400
	Dicotyledons,	5,473	64,000

or, to exhibit the proportions in another manner, it has been calculated that of every *thousand* plants on the globe, 158 are cryptogamous—namely, 110 cellular, and 48 vascular; and the remaining 842 phanerogamous—namely, 162 monocotyledonous and endogenous, and 680 dicotyledonous and exogenous.

To become acquainted with as many as possible of the 296 known orders, the 7500 known genera, and the 95,000 known species of vegetables, and to increase these numbers by the addition of as many new orders, genera, and species as yet remain to be discovered on the globe, are the objects of the systematic botanist. It is evident, however, that in this great work little could be done if the botanist were restricted to the observation of plants as they are found fresh and growing in their native situations. It is but a small patch, so to speak, of the vegetation of the earth that even the most active botanist can personally explore; and in order that he may have some acquaintance with what remains, devices are necessary for bringing absent plants under his examination. Verbal descriptions, especially if couched in the technical language agreed upon among botanists, are of great use for this purpose, illustrative drawings and paintings are still better; and the value of botanic gardens, where, by artificial means, vast numbers of exotic plants are made accessible, cannot be overrated. But supplementary to all these, and in many respects superior, are what are called *herbaria*—that is, collections of plants, or of the most important parts of plants, dried and preserved in such a manner as to exhibit their organs and forms. A herbarium may be small or large, special or general. Thus there might be a herbarium exhibiting complete specimens of the native vegetation of any single locality or neighbourhood—as, for example, Edinburgh or London; a larger herbarium might illustrate the vegetation of a single country—as, for example, Scotland or England; and a sufficient number of such herbaria, collected and brought together by the co-operation of the botanists of different countries, would form a herbarium of the whole world. Small herbaria have also occasionally been formed illustrative of particular books. Linnæus, for example, was occupied at one period of his life with a herbarium that was to contain specimens of all the plants mentioned in the Bible; and in a similar way a herbarium might be formed illustrative of Shakspeare or Keats—that is, explaining, by means of actual specimens, all the allusions to the vegetable world that occur in the writings of these poets.

Different botanists have employed different plans in the preparation of their herbaria. The usual mode is first to dry the specimens very carefully by pressing them in a warm atmosphere, or in sunlight, between sheets of paper, renewing the sheets until the drying is complete; and then to glue or otherwise fasten each plant to a single sheet of paper, on which is written the botanical designation of the plant, and any other particulars that the collector may wish to commemorate. To prevent the ravages of insects, the plants are sometimes sprinkled with pulverised camphor, or some other aromatic substance; various oils have been tried for the same purpose, as well as the exposure of the plants while drying to a high heat; but perhaps the most safe and efficacious plan is to make the plants imbibe, while drying, an alcoholic solution of corrosive sublimate.

While almost every individual botanist possesses his private herbarium or portfolio of dried plants, the formation of a great or general herbarium is a work of such expense that it is very seldom undertaken. Among the chief foreign herbaria are—that of the Royal Museum at the Jardin des Plantes in Paris, that of M. Decandolle at Geneva, the Imperial Herbarium at Vienna, the Royal Bavarian Collection at Munich, and the Royal Prussian at Berlin. In Great Britain there are several collections of great extent, the two largest being the herbarium of the Linnæan Society of London (the foundation of which was laid by the opportune purchase, for £1000, by the late Sir James Edward Smith, of all the botanical legacies of Linnæus, after the death of his son, the younger Linnæus), and the herbarium of the British Museum.

The nucleus of the extensive collection of dried plants now in the British Museum was the original herbarium, or rather collection of herbaria, left by Sir Hans Sloane. So ardent, from his earliest youth, was the desire of this excellent man to prosecute the study of natural history, that in the year 1687, being then in his twenty-seventh year, he left his practice in London, and the society of Ray, Sydenham, and others with whom he was intimate, to go out to the West Indies as physician to the Duke of Albemarle, then appointed governor of Jamaica—his chief inducement being the opportunity that would thus be afforded him of increasing his knowledge of botany. After an absence of fifteen months he returned to England, bringing with him a collection of West India plants (about 800 species in all), the fruit of his researches while abroad. This collection of plants, greatly enlarged by his subsequent acquisitions and purchases, was one of the items purchased by the nation from his executors after his death in 1753. The entire herbarium, as bequeathed by him, consists of 336 large folio volumes, bound in 262. Besides the plants collected by Sir Hans Sloane himself in Europe and the West Indies (of which latter a list was published by him so early as 1696, and a more detailed description is given in his 'Natural History of Jamaica,' in two volumes folio, published, the first volume in 1707, and the second twenty years later), it includes the collections of the early botanists Plukenet and Petiver. The collection of Plukenet, which 'consists of a great number of small specimens crowded, without apparent order, upon the pages of a dozen large folio volumes,' is peculiarly interesting to the botanist. Minor collections included in the general Sloanian Herbarium are those of the Duchess of Beaufort, Kiggalaer, Buddle, Uvedale, Hawkins, &c.; besides which, there are important contributions from the collections of Merret, Cunningham, Hermann, Bobart, Tournefort, Scheuchza, Kamel, Vaillant, Kæmpfer, Catesby, Houston, Boerhaave, and other eminent botanists of the latter part of the seventeenth and the early part of the eighteenth century.

The entire number of species included in the original herbarium of Sloane has been estimated at 8000; that of varieties at 10,000. Owing, however, to the imperfect state of botanical science at the time when it was formed, its value is now chiefly historical. 'From the great increase,' says Dr Asa Gray, 'in the number of known plants, it very frequently happens that the brief descriptions, and even the figures of older writers, are found quite inadequate for the satisfactory determination of the particular species they had in view; and hence it becomes necessary to refer to the Herbaria where the original specimens are preserved.' In this respect the Sloanian Herbarium still possesses great importance. If, for example, a London botanist were unable to understand to what West Indian plant, as now known, Sir Hans Sloane meant to allude in any particular passage of his work on Jamaica, he would easily ascertain the point by going to the museum and procuring a sight of the plant itself—the actual plant, in all probability, that Sir Hans had before him when he wrote the passage.

To facilitate such a use of the Sloane Herbarium, the volumes that compose it are kept together in several table-cases in the outer of the two rooms devoted to the botanical section in the museum. In this room is also kept the very interesting collection of plants presented to the Royal Society by the Apothecaries' Company during the seventy-four years beginning 1722, and ending 1796, at the rate of fifty new plants every year. This annual present of fifty new plants to the Royal Society was the rent that the Company were required to pay for their freehold of the Botanic Garden at Chelsea—the garden having been given them on that condition by Sir Hans Sloane in 1721 when he bought his Chelsea estate. The plants, carefully tied up, each fifty between two boards, are preserved in one of the table-cases, no longer as botanical rarities, but as historical curiosities. In the same room are kept various additions that were made from time to time to the original Sloanian Herbarium by the trustees of the museum. Among these one of the latest was the collection of Baron de Moll of Munich, consisting of forty-eight portfolios, and acquired in 1815.

It was not, however, till the year 1820, when, as has been narrated in the introductory sketch of the history of the museum, the great herbarium of Sir Joseph Banks was added to the treasures of the museum, that the botanical section became worthy of the rest of the institution. This herbarium, like that of Sir Hans Sloane, was composed of many separate items, acquired at various times by its assiduous owner. In addition to the collections of Sir Joseph Banks himself, including those made by him in his capacity as naturalist to the famous expedition to the South Seas under Captain Cook in 1768–1771, were the herbaria of Clifort, Hermann, Clayton, Aublet, Miller, and Jacquin, all eminent collectors of the last century, together with many plants that had belonged to Tournefort and other distinguished botanists. The herbarium of Cliffort possesses great claims on the attention of the botanist, as being the identical herbarium from which Linnæus compiled his celebrated early work, the 'Hortus Cliffortianus,' published in 1737. The original possessor of the herbarium was Mr George Cliffort, a wealthy banker in Holland, who, being a man of scientific tastes, and proprietor of a large garden and museum of natural history, seized the opportunity afforded him by the temporary residence in Holland of the Swedish naturalist, then a poor and young man, to place both under his charge. For two years Linnæus remained in Cliffort's house, treated, it is said, with princely munificence, and labouring assiduously in the rearrangement of his patron's museum and garden, and in the preparation, among other works, of the 'Hortus Cliffortianus,' a handsome folio, printed at Mr Cliffort's expense, and distributed among his friends. The herbarium, as classified by Linnæus, ultimately came into the possession of Sir Joseph Banks: it comprises some plants that are not to be found in the proper herbarium of Linnæus himself. Some of the other herbaria included in the general Banksian collection have also a historical interest. It was with the help of the Clayton Herbarium, for example, that

Gronovius edited his 'Flora Virginica;' and the plants that belonged to the early botanist Tournefort are all described by him in his 'Corollarium.' Aublet's collection was chiefly from French Guiana; and among the smaller collections included in the general herbarium are several others, whose interest originally depended on the circumstance that they illustrated the Flora of parts of the world that had only recently been explored.

Valuable as was the Banksian Herbarium at the date of its acquisition, it would now be far behind the state of botanical science, had not care been taken to augment it by regular additions as the science has advanced. Among these additions have been collections of plants from Africa, from the polar regions, and from other parts of the world—the results of the various expeditions fitted out since 1820 by government; as well as several valuable donations, including a number of plants sent by Loureiro from Cochin-China, a collection of Indian plants presented by the East India Company, and one of Egyptian plants presented by Sir J. G. Wilkinson. In 1835, when the entire number of vegetable species known amounted probably to between 60,000 and 70,000, the Banksian Herbarium numbered about 30,000, of which about 24,000 were arranged, and the remainder unarranged. At present, the entire number of known species being reckoned at 100,000, the number contained in the Banksian Herbarium is probably as large a proportion of this as is to be found in any existing collection, except that of Paris.

The Banksian Herbarium, being properly the true herbarium of the museum, constitutes the chief portion of the entire botanical section. The following extract from a paper in Silliman's Journal, by Dr Asa Gray, will show the manner in which it is kept:—'The herbarium of Sir Joseph Banks is probably the oldest prepared in the manner commonly adopted in England, of which, therefore, it may serve as a specimen. The plants are glued fast to half-sheets of very thick and firm white paper of excellent quality, similar to that employed for merchants' ledgers, all carefully cut to the same size, which is usually 16½ inches by 10¾, and the name of the species is written on the lower right-hand corner; and all the species of a genus, if they be few in number, or any convenient subdivision of a larger genus, are enclosed in a whole sheet of the same quality, and labelled at the lower left-hand corner. These parcels, properly arranged, are preserved in cases or closets, with wooden folding-doors made to shut as closely as possible — being laid horizontally in compartments just wide enough to receive them, and of convenient depth. In the Banksian Herbarium the shelves are also made to draw out like a case of drawers. This method is unrivalled for elegance, and the facility with which the specimens may be found and inspected.'

In addition to the Sloanian and Banksian Herbaria, the Botanical Rooms contain various other collections of objects interesting to the botanist. Among these may be mentioned the collection of preserved seeds, fruits, &c. that formed part of the Sloane bequest; the similar collection of flowers and fruits, chiefly of rare succulent plants, preserved in spirits, that were left by Sir Joseph Banks; a suite of models of fungi, to be seen in one of the open cases of the outer room; and a series of specimens of the principal woods used, or capable of being used, in the arts. An object of some interest in one of the open cases is a specimen, believed to be at present unique in Europe, of an entire nut of the vegetable ivory tree. In short, of almost every class of vegetable objects, small enough or durable enough to be kept in the apartments of a building, there are specimens in the Botanical Rooms of the museum. Some whole trunks even of rare and curious trees are placed in corners of the outer room, where they may be handled and inspected.

Although the botanical section of the museum is chiefly useful as a collection where professed and highly-educated students of botany may find all the materials they may require in the prosecution of their researches, it is by no means without its uses as regards the public in general. Not long ago, for example, an eminent silversmith in the metropolis having received an order for a costly piece of plate, one of the ornaments of which was to consist of a finely-executed representation of the lotus-plant, sent an artist to the museum to select from among its botanical treasures a real lotus suitable for the purpose, and make a perfect model of it. Again, among the specimens of wood preserved in the museum, there are doubtless many that, if once brought into fashion by the cabinet-maker, and made generally known, would be preferred for certain purposes to some of the expensive kinds now in use. Although necessarily shut to the miscellaneous public, the botanical department of the museum is at all times accessible to persons having scientific objects in view, and on making proper application.*

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* In connection with this section, see a paper by Dr Asa Gray, entitled *Notices of the Principal European Herbaria*, in vol. xlvi. of Silliman's American Journal; the 'Musée Botanique de M. Benjamin Delessert, par A. Lasseque—Paris, 1845'—a work containing, besides much interesting matter relating to the history of botanical science, detailed references to all the great European herbaria; and, for general information, treatises on *Vegetable Physiology* and *Systematic Botany* in 'Chambers's Information for the People.'

ZOOLOGICAL SECTION.

According to the system of Cuvier, now generally adopted, the animal creation is divided into four great departments or sub-kingdoms, arranged in the supposed order of their dignity, beginning with the lowest, and ending with the highest, as follows:—I. RADIATA, or radiated animals, so called because their structure is that of a number of rays or radii diverging from a central point or disk, in which the nervous force of the animal is supposed to reside. II. ARTICULATA, or jointed animals, so termed because their bodies consist of a number of movable pieces jointed or articulated together. III. MOLLUSCA, or soft-bodied animals, so called because, instead of possessing any distinct skeleton, they consist merely of a soft mass, containing one or two ganglia, or knots of nervous matter, and enveloped for the most part in a hard case or shell. IV. VERTEBRATA, or animals with a backbone, so named because they have the brain and the principal trunk of their nervous system enveloped in a bony articulated case, consisting of a skull and a spine or backbone attached to it. To distinguish the first three divisions from the fourth, they are sometimes included under the joint designation of *invertebrata*, or invertebrate animals—that is, animals without a backbone.

These great divisions are subdivided into classes as follows:—I. RADIATA, containing five classes—1. *Infusoria*, or infusory animalcules, so called because they are seen by the microscope moving in millions through all water into which animal or vegetable matter has been infused; 2. *Zoophyta*, or 'animal plants,' called also *polypi*, or polypes; 3. *Entozoa*, or intestinal worms; 4. *Radiaria*, or ray-fishes. II. ARTICULATA, containing four classes—1. *Annellata*—that is, 'ringed animals,' including leeches and worms; 2. *Cirripeda*, or 'curl-footed animals,' including barnacles and sea-acorns; 3. *Crustacea*, or 'animals with a hard crust or covering,' as crabs, lobsters, shrimps, &c.; 4. *Insecta*, or insects, including, besides insects properly so called, spiders, scorpions, &c. which, however, are sometimes erected into a separate class termed *arachnida*. III. MOLLUSCA, containing five classes—1. *Gasteropoda*, or belly-walking molluscs; 2. *Conchifera*, including the majority of bivalve shell-fish; 3. *Brachiopoda*—that is, shell-fish moving by means of long arms or cilia; 4. *Pteropoda*, those having neither feet nor arms, but moving by means of wings or fans; and 5. *Cephalopoda*, or those moving by means of tentacles round the head. IV. VERTEBRATA, containing four classes

—1. *Pisces*, fishes; 2. *Reptilia*, reptiles; 3. *Aves*, birds; and 4. *Mammalia*, or animals that suckle their young. Such, arranged on the principle of gradation from the lower upwards to the higher organizations, is the classification now usually adopted, different naturalists, however, making different unimportant modifications in it to suit their particular views.

It is obvious that à complete collection of zoological objects—that is, a collection representing the entire range of animated nature—cannot be contained in such a place as a museum. Of the minuter kinds of animals—as infusoria, zoophyta, &c. —it is scarcely possible in any certain manner to preserve specimens at all; and even those kinds large enough and durable enough to be kept, can be exhibited only under certain restricted conditions, and by means of certain very imperfect contrivances. Of some—as, for instance, the majority of molluscs—only the shells or hard parts can be preserved; others, such as reptiles and the smaller fishes and mammalia, must be kept in spirits; while many, as birds and the larger mammalia, must be stuffed. A zoological collection in a museum, therefore, can be at best but a poor representation of the great world of animated existence. To the scientific student, however, who can fill up whatever is wanting, such a collection is invaluable; and even to the casual visitor the spectacle of so many strange and new forms of life as are there to be seen gathered from all the elements, and from all parts of the globe, cannot fail to be eminently instructive, calculated as it is to enlarge and diversify his notions of the world and its wonders.

The best way of examining a zoological collection, where it is practicable, is to single out, first, the specimens of the lowest classes of animal life—namely, those belonging to the subkingdom radiata—and thence gradually to ascend to the higher organisms, the articulata, the mollusca, and the vertebrata. By such a method the peculiarities of the individual animals are more attentively observed, and the hierarchical arrangement of the whole made more clearly manifest. In the present instance, however, owing to the imperfect manner in which the zoological department of the museum is arranged—objects quite heterogeneous being in several places assembled together for the sake of convenience—this order cannot be very rigidly adhered to. On the whole, therefore, it will be most advantageous to follow the arrangement according to rooms, using the scientific classification only for the purpose of farther determining the order in which we shall take the different rooms, and the order in which we shall inspect the different objects contained in each. According to this arrangement, let us begin with

THE NORTHERN ZOOLOGICAL GALLERY,*

which consists of a long narrow suite of five rooms, and contains the objects belonging to the sub-kingdoms radiata and articulata, together with specimens of mollusca and vertebrata. We shall group the contents of this gallery as nearly as possible in their scientific order.

I.—Radiata.

Room II—Sea-Eggs and Star-Fishes.—Passing through Room I, which does not contain any objects belonging to this sub-kingdom, we find in the Table-Cases of Room II an extensive collection of the hard parts of radiaria, or ray-fishes, the highest class of radiata. This class is now usually divided into two sub-classes—the *Acalephæ*, or sea-nettles (such as the medusa, or jelly-fish), which are of a soft, gelatinous structure, inhabit the open sea, and derive their name from their powers of stinging; and the *Echinodermata*, or prickly-coated ray-fishes (from the Greek *echina*, a hedgehog, and *derma*, a skin), which have a hard integument, and live at fathomable depths. It is of the echinodermata alone that we have any specimens in the cases under notice.

Echinus.

First (Room II, Table-Cases I–IX) we see specimens of the order of echinodermata, known as *echinidæ*, or more popularly as sea-urchins or sea-eggs. The appearance of the external shell of these animals must be familiar to almost every one—a brittle globular case of calcareous matter, covered with small tubercles or prominences, and frequently to be seen forming a humble ornament to mantelpieces. But in its living state, the animal has a much more complex aspect, the whole exterior of the shell being then covered with spines, or prickles, loosely fitted to the surface, and capable of being moved freely in the water as the animal pleases. As these spines easily drop off when the animal is dead, specimens with spines attached to them are rare in collections. The structure of the shell of the echinus, which consists of a number of pentagonal pieces fitting together, the method by which it is increased by a calcareous secretion from the body of the animal, and the mechanism by which the spines are attached, are subjects of great admiration among naturalists. The interior structure is very simple, consisting only of a powerful and muscular mouth armed with strong teeth, and of an intestinal tube wound twice round the inside of the shell. At certain seasons the vacant portions of the interior are filled with ova; and at these seasons sea-urchins are used on some coasts as an article of food, the ova being extracted and eaten like the roe of a fish. Echinidæ are found generally on sandy shores, and seem to prefer quiet and secluded pools, where they may bury themselves in holes dug by means of their spines. Some even make excavations in the solid rock. Their food consists of sea-weeds and small animals, chiefly crustacea. All echinidæ are not of a globular shape; some are so depressed, that there seems to be scarcely room for any internal viscera. Of these flat echinidæ, popularly known as sea-pancakes, there are some curious specimens in Cases VII and VIII. Of another genus of echinidæ, called *galerites*, and most frequently found in a fossil state, there are specimens in Case IX.

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* During the progress of this volume through the press, various alterations have been made in the arrangements of the Northern Zoological Gallery. These will be indicated in an Appendix: meanwhile the visitor will find little difficulty in identifying the objects referred to, even where they have been shifted from one case into another.

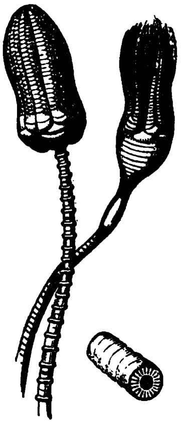
In the remaining Table-Cases of this Room (XI-XXIV) is a collection of the order of echinodermata called *stelleridæ*, or star-fishes. First (Cases XI-XVIII) are specimens of the more common kinds, whose structure is that of a number of tough leathery rays diverging from a central disk. In this disk, and on the lower side of the animal, is situated the mouth, which opens into a stomach filling the disk, and branching off into the rays. The animal feeds on any organic substance, living or dead, drawing it towards it as it swims by means of small flexible suckers projecting from its body, and afterwards ejecting the undigested parts from the mouth itself. The various forms of the star-fish are innumerable. 'Some have five, and others many rays; some have the surface scattered with tubercles placed on the junction on a net-like skeleton; and others are formed of flat-topped pieces like a tesselated pavement, each separate stem being fringed with an edge of minuter pieces; some of them bear on the top of each of the flat pieces a solid tubercle, which often falls off when the animal is dead.' Star-fishes are to be found in every climate; and the appearance they present when in the water is extremely interesting to the zoological student. 'Let any of our readers,' says Professor Rymer Jones, 'pick up from the beach one of these animals, the common star-fish of our coast, which, as it lies upon the sand, left by the retiring waves, appears so incapable of movement, so

Star-fish.

utterly helpless and inanimate; let him place it in a large glass jar filled with its native element, and watch the admirable spectacle which it then presents: slowly he perceives its rays expand to the full stretch; hundreds of feet are gradually protruded through apertures, and each, apparently possessed of independent action, fixes itself to the sides of the vessel as the animal begins to march. The numerous suckers are soon all employed fixing and detaching themselves alternately; and thus, by an equable gliding movement, the star-fish climbs the sides of the glass in which it is confined, or the perpendicular surface of the marine rock.'

In Cases XIX-XXIII is a collection of those singular kinds known as lizard-tailed star-fishes, or more popularly as 'brittle stars;' so called because they have the faculty of falling to pieces, or at least throwing off the ends of their rays, when seized or otherwise alarmed. In the cases under notice, specimens may be seen in all stages of disintegration; some with one or more rays off, others with scarcely a fragment left attached to the disk. The fishermen on our coasts believe that the specimens they find in this dismembered condition have had their limbs snipped off by oysters which they have been trying to catch; but the following passage from Professor Edward Forbes, descriptive of a particular species called the *Luidia fragilissima*, gives the true account of the matter:—'The first time,' he says, 'I ever took one of these creatures, I succeeded in getting it into the boat entire. Never having seen one before, and quite unconscious of its suicidal powers, I spread it out on a rowing bench, the better to admire its form and colours. On attempting to remove it for preservation, to my horror and disappointment I found only an assemblage of rejected members. Next time I went to dredge on the same spot, determined not to be cheated out of a specimen in such a way a second time, I brought with me a bucket of cold fresh water, to which article star-fishes have a great antipathy. As I expected, a *luidia* came up in the dredge—a most gorgeous specimen. As it does not generally break up before it is raised above the surface of the sea, cautiously and anxiously I sunk my bucket to a level with the dredge's mouth, and proceeded in the gentlest manner to introduce *luidia* to a purer element. Whether the cold air was too much for him, or the sight of the bucket too terrific, I know not, but in a moment he proceeded to dissolve his corporation, and at every mesh of the dredge his fragments were seen escaping. In despair I grasped at the largest, and brought up the extremity of an arm with its terminating eye, the spinous eyelid of which opened and closed with something exceedingly like a wink of derision.' This self-dissolution of the *luidia* and other star-fish is not, however, an act of suicide, inasmuch as the animal has the power of reproducing the parts it has lost. In Case XXIII are several specimens of an extraordinary species, called *the gorgon's head*, 'the arms of which are repeated branches, ending in innumerable flexible filaments, by which the animal attaches itself to marine bodies, and strains its food from the surrounding water.'

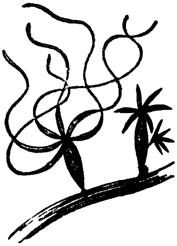
Of all the star-fishes in the museum, the most interesting are the specimens in Case XXIV of the kind called *comatula*, or sea-wigs. These comatula have a branch-like structure, like that of the gorgon's head; but what renders them peculiarly interesting is, that they are the recent representatives of a tribe of sea-animals now all but extinct, although found in immense abundance in a fossil state. To illustrate this connection between the existing comatula and their fossil predecessors, there is placed in the same case a beautiful cast of one of the fossils in question—the *encrinite*, or stone-lily; so called because it presents the appearance of a flower-like top or bulb, supported on a delicate and flexible stalk. Whole tracts of sea appear at one time to have been full of these plant-like star-fishes—some irremovably fastened by their roots to the bottom, or to submarine rocks, while their tops and jointed stems swayed to and fro in the water; others attached to the bottom only by means of a sucker, and capable at pleasure of quitting their hold, and going in search of a new location. The general name now given to these curious animals of a former era is that of *crinoideæ* (lily-like), or crinoid star-fishes, of which the encrinite, or stone-lily, is but one description. 'Scarcely a dozen kinds of these beautiful animals,' says Professor Forbes, 'now live in the seas of our globe, and individuals of these kinds are comparatively rarely to be met with; but formerly they were so numerous, that the remains of their skeletons constitute great tracts of the dry land as it now appears. For miles and miles we may walk over the stony fragments of the crinoideæ.' Such fossil crinoideæ are very common in particular localities in the north of England, where the detached fragments, or vertebræ, of the stalk, still known as 'wheel-stones,' or 'St Cuthbert's beads,' were formerly used for making rosaries. Although, as stated by Professor Forbes in the foregoing extract, there are still several living


Encrinite.

kinds of crinoideæ, this fact was not established till the year 1823, when a very small species was discovered in the Cove of Cork. The naturalist who made the discovery afterwards announced the important fact, that this small crinoid was but the young state of a star-fish previously known as the *Comatula rosacea;* hence the zoological identification of such fossils as the stone-lily with objects at first sight so unlike them as the sea-wigs.

ROOM III—CORALS.—In the Table-Cases of this room are arranged various kinds of coral, brought from all parts of the world. Although, in virtue of their composition (chiefly carbonate of lime), these curious objects come within the consideration of the mineralogist, yet in respect of their animal origin they belong more properly to the domain of the zoologist, who, as he looks over a collection of corals, sees in them but materials for studying the nature and habits of that particular class of radiata called zoophyta, or polypes.

Perhaps the simplest form of that class of animals to which the coral-polypes belong is the *hydra*, or fresh-water polype—a minute animal, often found in great abundance clinging to the leaves or stems of aquatic plants. It consists of a jelly-like body, with a number of long threads, or tentacula, attached to it, and floating about in the water. By means of these tentacula—which seem to have the power of communicating some slight electric shock, or of otherwise stunning small insects, worms, &c.—the hydra provides itself with food. But the most curious circumstance connected with this creature is its power of reproducing itself, or repairing any injury it may receive. It may be cut into ever so many pieces, and each piece will become a perfect hydra; it may be turned inside out, like the finger of a glove, and will continue to live and act in this new state as well as before; and two or more hydræ may be incorporated so as to form but one. These extraordinary animals propagate by gemmation—that is, by sending forth from their surface little buds or knobs, which sprout, and ultimately detach themselves from the parent polype. Analogous, in the eye of the scientific observer, to the fresh-water hydra, although very different in appearance, is the *actinia*, or sea-anemone—so called from its resemblance, when in the water, to such flowers as the daisy, the marigold, &c. These animals, which may be found on any coast after the recess of the tide, have a soft, fleshy body, with tentacula serving the same purpose



Hydra.

as those of the hydra. Like the hydra, they have the power of quitting the spot to which they are attached; produce their successors by gemmation; and will bear any amount of mutilation or ill-usage without appearing to suffer. They seem also to be very long-lived, an instance being known of an actinia having been kept alive for twenty years.

Although both the hydra and the actinia exist in the individual form, the young buds or progeny soon quitting the body of the parent, there are other animals of the same general class in which the buds do not detach themselves, but attain their perfect state, and produce buds themselves, while still adhering to the original stem; the final result of this process, continued for some time, being what is called a *polypidom*—that is, an aggregation of countless individual polypes, all having an independent existence, and yet all associated as parts of one vital mass. This power of aggregation among polypes seems also to be usually accompanied with the possession of a hard, membraneous, or calcareous skeleton. And thus we obtain an idea of the real nature of what are called the coral formations. All these formations, infinite as are their varieties in shape, colour, and beauty, are but aggregations of the remains of innumerable polypes of one species or another. 'If, for example, the stem of the common *red coral* be examined when clothed with the living flesh, its surface is seen to be scattered over with polypes, the structure of each of which bears some resemblance to that of the sea-anemone; but these, so far from being independent of one another, like so many sea-anemones attached to the same rock, are connected by a system of vessels traversing the flesh, and bringing them all into communication. Nevertheless any one of them would live if detached from the rest, and would gradually produce others until a new structure were formed similar to that of which it was a part.' In other words, every branch of coral may be considered as a tree or plant, all the buds of which are animated polypes.

Zoologists divide polypes into four orders:—The HYDROIDA, of which the fresh-water hydra is the type; the HELIANTHOIDA, of which the sea-anemone is the type; the ASTEROIDA; and the ASCIDIOIDA. Each of these orders is subdivided into genera, and the genera are farther subdivided into species. The first two orders, as we have seen, furnish individual representatives, only some of their genera exhibiting the phenomenon of aggregation; but of the last two orders, so far as is yet known, all the genera are aggregative. The orders that chiefly furnish the substances included under the designation of coral are the helianthoida and the asteroida. To the former belong the *fungia*, or sea-mushroom, a gigantic tropical polype, existing singly, and having a beautiful stony cell, consisting of a thick round plate several inches in diameter, with numerous thin vertical plates rising from it, and radiating from its centre; the *meandrina*, or brainstone—so called from its resemblance in form to a human brain, and which is, in fact, an immense polypidom, built by polypes whose habits lead them to form long tortuous furrows instead of round cells; and also the extensive family of the *madrephylliæa*—the coral-building polypes of the South Seas, some of whose reefs are known to be upwards of 1000 miles long, and more than 300 miles broad. It was formerly supposed that these polypes worked at unfathomable depths; but it is now established that they work only within a few fathoms of the surface, founding their enormous structures on submarine rocks, &c.; and the great depth from which coral is sometimes dredged is accounted for by the supposition of a gradual subsidence of the bottom of those seas where the coral polypes are at work. Among the kinds of coral supplied by the order of polypes known as the asteroida, may be mentioned the *gorgonia*, or sea-fan, sometimes thrown ashore on British coasts; the *pennatula*, or sea-pen, also found in the British seas; the *Tubipora musica*, or organ-pipe coral; the *Isis hippuris*, the stem of which is partly horny and partly calcareous; and the beautiful *red coral* of commerce. The *massive* varieties of coral, however, belong almost exclusively to the order helianthoida. In the cases under notice, specimens are to be seen of all the kinds above mentioned—sea-mushrooms, brain-stones, &c. —besides numerous others, among which may be instanced the *millepore*, whose characteristics are its extreme rapidity of growth, and the facility with which it encrusts shells, &c. that come in its way, assuming their forms.

Meandrina.

ROOM V—SPONGES, &c.—Besides specimens of radiata preserved in spirits, and contained in the wall-cases along with crustacea and mollusca similarly preserved, there is in this room a small collection of the well-known marine substances called *sponges*. As to the true nature of these extraordinary substances naturalists are not altogether agreed, some ranking them among vegetable, and others among animal organizations; they are usually placed, however, in the animal kingdom, and erected into a distinct class of radiata called *porifera*, analogous in some respects to the zoophyta.

The common sponge, as is well known, consists of a tough, horny, or elastic aggregation of fibres, penetrated throughout with minute pores, and also with larger orifices or vents. In some kinds of sponge, however, the soft substance of the sponge is traversed and rendered more consistent by hard *spicula* —needles of siliceous or calcareous matter—round which the softer parts are attached. In some specimens the entire substance of the sponge has been found to be siliceous or calcareous. In all cases, however, a sponge—whether it presents throughout the soft elastic texture that we see in the beautiful toilet-sponges which are dredged up in the Grecian Archipelago; or the compound texture, half-stone and half-fibre, that marks the coarser article found on various other coasts; or finally, the completely siliceous or calcareous texture to be seen in some museum-specimens —is to be regarded as but the skeleton of the living being. When alive, the whole sponge is covered without, and saturated within, with a thin, gelatinous substance resembling the white of an egg. In this gelatinous substance the vitality of the sponge is supposed to lie—a vitality manifested not only by the regular growth of the sponge, but also by a kind of circulation that may be seen going on within the mass, the smaller pores appearing to be continually absorbing, while the larger vents appear to be continually ejecting, the sea-water. This, in fact, is the process of nutrition by which the sponge supports its life and increases its bulk; and on a close examination the little solid particles which form the food of the sponge may be discerned entering the pores in the currents of water. The pores and vents being therefore the chief organs, if we may so speak, of this singular marine animal, it is according to differences in the position of these, &c. that sponges have been classified. In some the pores are all on one side, and the vents all on the other; others are shaped like little hills or cones, having the pores in the sides, and the vent on the summit, like the crater of a volcano, the resemblance being rendered still more exact by the constant stream that issues from the orifice; and some are shaped like hollow cylinders, with the pores on the exterior and the vents discharging themselves into the interior surface. Sponges propagate, like polypes, by gemmation—small gelatinous knots detaching themselves from the body of the sponge, and afterwards assuming the parent shape; like polypes, also, they reproduce whatever parts are torn off, and the smallest fragment cut from a sponge will grow and complete itself. To fit sponges for use, the gelatinous matter forming their flesh is drained away by means of hot water, and the fibrous skeleton otherwise cleaned.

In the Table-Cases of Room V are different kinds of sponges, showing the various arrangements of the pores, vents, &c. above alluded to; and also some ancient sponges preserved in flint, showing similar varieties of structure. In one of the wall-cases are some specimens from Singapore of a peculiar species called Neptune's Cups.

II.—Articulata.

ROOM I—CASINGS OF TUBICOLOUS ANNELLATA.—Of the four great classes into which the sub-kingdom of the articulata is arranged, the first—namely, the annellata, or animals of ringed structure—is subdivided into four orders or families: the *Suctorial Annellata*, or leeches; the *Terricolæ*, or earthworms; the *Tubicolæ*, or such as inhabit tubes, composed either of calcareous matter secreted from their own bodies, or of sandy particles agglutinated by their juices; and the *Errantes*, which are more highly organized, and more capable of rapid locomotion than the others, and of which we have examples in the long sea-worms inhabiting the slime of our harbours. In Table-Cases I and II of this room are to be seen some curious specimens of the tubes or casings of animals of the third of these great orders; particularly of the *serpulæ*, whose small contorted tubes are to be found encrusting stones, oyster shells, and other substances which have lain long at the bottom of the sea. Few are aware that such little fantastic wreathings of white crust are the dwellings of living animals belonging to the same class of creatures as worms; and yet possibly no animal is more suitably housed, according to its nature, than the serpula. 'If while the contained animals are alive,' says Professor Jones, 'the tubes be placed in a vessel of sea-water, few spectacles are more pleasing than that which they exhibit. The mouth of the tube is first seen to open by the raising of an exquisitely-constructed door, and then the creature cautiously protrudes the anterior part of its body, spreading out at the same time two gorgeous fan-like expansions of a rich scarlet or purple colour, which float elegantly in the surrounding water, and serve as breathing organs.' The tube is merely the dwelling of the serpula, as the shell is of the snail, and there is no muscular connection between them. The serpula secretes its own tube. Among the animals of the same order that form their tubes by agglutinating particles of sand, &c. are the amphitrite, the sabella, and the terebella. All these animals have a tendency to aggregate, so that masses of considerable size are often formed of their tubes. Few portions of zoology have been so little studied as that relating to the tubicolous annellata.

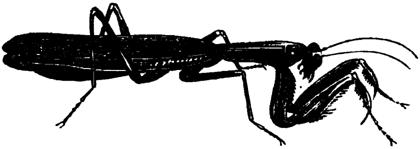
ROOM IV—INSECTS AND CRUSTACEA.—Perhaps the most attractive part of the contents of the Northern Zoological Gallery are the Table-Cases of this Room, the first twelve of which (Cases I-XII) contain a collection of insects, and the last twelve (Cases XIII-XXIV) a collection of crustacea. These, however, form only a selected portion of the insects and crustacea in the museum, the remainder being preserved in appropriate cabinets in rooms situated on the ground-floor of the building, near the Egyptian saloon. The reason of this is, that of all portions of a zoological collection, the insects and crustacea suffer most from exposure—the insects especially, on account of the extreme delicacy of their organization. Persons, however, pursuing systematically the study of zoology, may be admitted, after proper application, to the rooms where the general collection of this class of objects is kept; and may there consult any special cabinet that may contain the particular species of insects or crustacea which they wish to inspect. But for the public at large such a privilege would be useless: and in the twenty-four cases now under notice there is a collection sufficiently ample to gratify all ordinary curiosity.

Cases I-XII—INSECTS.—Of all the classes of articulata, the insects, as being not only the most elaborately organised, but also the most numerous and the most familiar, deserve the greatest share of the attention of the zoologist. Accordingly, the study of their structure and habits has been elevated to the rank of a sub-department of general science under the name of *Entomology:* this word being derived from the Greek—*entomon* meaning an *insected* or *notched* animal—a term first applied by Aristotle to this section of animal life, in allusion to the notched appearance of the bodies of insects, and of which the word *insect* itself is but a translation through the Latin. True insects are defined by the following characteristics:—in their adult state they have six legs, a system of breathing tubes traversing the whole interior of their bodies, their bodies themselves divided into three parts—a head, a thorax, and an abdomen; they have also for the most part one or two pairs of wings, and in the course of their growth from the egg to the adult state, they generally pass, as in the case of the butterfly, through the intermediate states of the grub or larva and the pupa or chrysalis. This definition of insects, which some zoologists restrict still farther, excludes many articulated animals that were once included under the name; and among these, spiders and their allies, which differ from true insects in having eight or more legs and no wings, in having their head and thorax united, and in undergoing no transformation in their passage from the young to the adult state. The spider tribe is accordingly distinguished scientifically from the insect tribe by the term *arachnida.* Popularly, however, spiders, &c. are still called insects; nor in the arrangement of the cases under notice is any very marked separation made between I-X, containing the true insects, and XI-XII, containing specimens of the spider family.

Insects have been variously classified, but the most usual classification is that which arranges them (according to the varieties they present in the position, structure of their wings, &c.) into eight orders, as follows:—1. Coleopterous, or sheath-winged insects—such as beetles, in which the two anterior wings serve as a horny case or sheath for protecting the two posterior when folded; 2. Orthopterous, or straight-winged insects—such as crickets, grasshoppers, cockroaches, &c. having four wings generally equal in size, and folded longitudinally when at rest; 3. Neuropterous, or nerve-winged insects—such as dragon-flies, which have four large wings equal in size, traversed by nervures or threads, and exhibiting in some species a beautiful reticulated texture; 4. Hymenopterous, or membrane-winged insects—such as the bee, the wasp, &c. which have four unequal wings, veined less closely and more strongly than in the neuropterous order; 5. Lepidopterous, or scaly-winged insects—such as butterflies and moths, whose wings are covered with a mealy powder, consisting of innumerable minute scales; 6. Dipterous, or two-winged insects—as flies, gnats, &c.; 7. Hemipterous, or half-winged insects—as bugs, &c. which have the anterior wings of a horny or leathery consistency; 8. Apterous, or wingless insects—such as the flea, the louse, the centipede, &c. Going over the cases in succession, the visitor finds examples of all the foregoing orders; thus traversing, as it were, in a few paces the whole field of entomology. But how different the cursory glance of the uninstructed visitor, who can but observe, half-curiously, half-loathingly, the external forms and colours of the various strange insects there pinned down on cards to be gazed at, compared with the educated scrutiny of the professed entomologist, who, having long since exchanged for an opposite feeling the common sense of disgust at the forms of insect-life, will pass along the cases regarding all that he sees—beetles, bees, earwigs, and spiders—almost with fondness, recognising them as old acquaintances, and remembering at the moment hundreds of stories of their habits, eccentricities, and modes of existence.

Coleopterous Insects or Beetles—Cases I-III.—This is the most numerous of the insect orders, including even at present about 40,000 known species, native and foreign; and some large zoological works are devoted exclusively to it. For the convenience of arranging so vast a multitude of species, the beetle order is divided into sections and sub-sections, according to certain scientific distinctions: some are carnivorous, some herbivorous; some live on water, some on land, and so on; and in each case the conformation of the beetle corresponds. More obvious to the popular eye than these distinctions are the striking varieties of size and colour presented by beetles. Some attain such a size as almost to appear formidable, others are extremely minute; and of the differences of hue that they exhibit it is impossible to give an enumeration. In this matter of colour, however, as indeed may be generally remarked throughout the whole animal creation, there is an adaptation to the habits and necessities of the creature: every species of beetle, as a general rule, resembling in colour the substance or element in which it lives. 'Thus the dull-brown and black beetles for the most part frequent the earth; those of a green colour are principally found among the leaves of plants; those of a red or bright metallic hue, which abound in tropical climates, rather frequent flowers; others again, of an aspect like decaying wood, live chiefly upon or within timber.' Among the beetles in the cases under notice the most worthy of mention are the following, which may be readily identified by the inscriptions attached to them:—(Case I). The mormolyce, or leaf-beetle, from Java: the necrophorus, or burying-beetle, so called from its habit of excavating the earth, with the assistance of others of its own species, from under the dead body of a frog, a bird, or any other small animal that may be lying about, so as ultimately to bury it to the depth of some inches, having previously deposited its eggs in the decaying flesh, and thus provided its future larvæ with a store of food: the lucanus, or stag-beetle, so called from the resemblance of its mandibles, or jaws, to the crooked horns of a stag, of which genus there is a British species, the males of which are often two inches long: the famous scarabæus, or sacred beetle of Egypt, of which mention has been made in a previous part of this volume, allied to which is the common dor or shard-borne beetle of Britain, and another British species (*Geotrupes vernalis*), which, like the scarabæus, collects little balls of dung in which to bury its eggs, but always saves itself this trouble in districts where sheep are kept, by availing itself of the little pellet-shaped droppings of that animal: the rhinoceros, elephant, and bubaline beetles, which 'have the front of the head or the front of the thorax produced into variously-shaped horns or humps.' (Case II): The buprestidæ, a tribe of tropical beetles distinguished for the metallic brilliancy of their colours—gold upon green, or azure upon gold—and the hard wings of which are often used as spangles for dresses in the countries where they are native: the elater, or spring-jack beetle, so called because when laid on its back it rights itself by leaping up in the air so as to light on its feet, of which genus there is one curious species, found in South America and the West Indies, and named the *Elater noctilucus*, or lantern spring-jack, on account of the luminosity of parts of its body at night: various kinds of lampyrides, or glow-worms, well known for the brilliant phosphorescent light emitted by the females at night to attract the males: various species of curculiones, or long-nosed beetles, an extensive family, including nearly 4000 distinct species, of which the best known is the common weevil, whose larvæ are found in nuts, and the most splendid is the *Curculio imperialis*, or diamond beetle of Brazil, accounted the king of all the beetles: the prionii, which have long jaws, and live chiefly in old wood: and finally (Case III), various other orders, such as the sagræ, or false kangaroo beetles, with large hind-legs: the tortoise beetles, so called from their resemblance in shape to tortoises: and a collection of the well-known little beetles called lady-birds, some of which are exceedingly brilliant.

Orthopterous Insects—(Cases III-IV).—Insects of this order differ from the coleoptera not only in the character of their wings, but also in having softer bodies, and in not undergoing so perfect a series of transformations, their larvæ and pupæ bearing a closer resemblance to the adult insect than in the case of the coleoptera. Among the specimens may be enumerated the following:—(Case III). The earwigs, so called from the mistaken notion that they try to creep into the ears of sleeping persons; the blattæ, or cockroaches, which were originally natives of tropical countries, but are now naturalised in England and other parts of Europe; the mantides, or praying insects, so called from their habit of raising their two enormous fore-legs in an attitude supposed by the natives of the countries they inhabit to be that of prayer—a belief which has procured them in these countries a degree of respect that they seem by no means to deserve, for, as naturalists tell us, they are the most pugnacious and ferocious of all insects, fighting individuals of their own species, preying on others, and only assuming the attitude to which they owe their reputation for goodness when they are about to tear off the head of their antagonists or do some other mischief; the extraordinary Phyllia siccifolia, or walking-leaf insects, which feed on vegetables, and some of which are so exactly like pieces of dry twig, that it would be impossible, without close inspection, to discern the difference—



Mantis Religiosa.

while others (as may be seen from a most beautiful specimen that must attract the notice of every visitor) elude detection in a similar manner by means of large green or brown wings, that, both as regards colour and texture, look exactly like the fresh or dead leaves of a tree. (Case IV). The various kinds of crickets, including a monstrous Chinese species with extraordinary toes and curled wings; and various specimens of grasshoppers; and also of the locusts, whose ravages, when they come in great numbers, render them the terror of warm countries.

Walking Leaf.

Neuropterous Insects—Case IV.—This is a comparatively small order, but it presents curious varieties, especially as regards the mode in which its larvæ are reared—some being reared in the water, some in damp earth, and others on plants. Among the specimens exhibited in the museum may be enumerated —the libellulæ, or dragon-flies, which feed on other insects, are exceedingly rapacious, and deposit their eggs in the ponds over which they may be seen hovering in bright summer days; the myrmelionidæ, or ant-lions, a beautiful tropical insect, whose larvæ provide their food by the curious process of lying in a conical sand-pit of their own digging, into which they either drag passing insects with their long mandibles, or make them fall by setting the sand in motion; the panorpa, or scorpion-fly; the destructive termites, or white ants of the tropics, the larvæ of which live in colonies in the interior of any kind of timber, boring it in all directions, but never coming to the surface, so that the injury they have done is not discovered till some accident causes the tree, or the joist, or the piece of furniture in which they are lodged, to fall in pieces; and lastly, various specimens of the curious artificial packing-cases, some of one material, some of another, in which the larvæ of the caddis-fly float about on running streams and ditches until they attain their adult form.

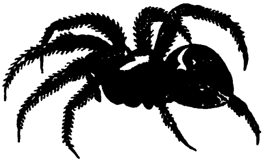
Hymenopterous Insects—Case IV.—In this order are included the well-known insects bees, wasps, and ants or hornets, to give a detailed account of whose varieties and habits would require a volume. Specimens of different genera of these familiar but wonderful insects are exhibited in the case under notice, along with specimens of less-known families of the same order—such as the saw-fly, the female of which is furnished with a pair of saw-like instruments, by means of which she cuts a passage into the plant or fruit in which she is to deposit her eggs; and the ichneumon, which deposits its eggs in the bodies of the larvæ of other insects, especially garden caterpillars, by which device not only is its own purpose served of providing its young with food, but a service is rendered to humanity by the enormous thinning thus effected in the general insect population.

Lepidopterous Insects—Cases V-IX.—This is an extensive order, comprising about 12,000 known species, of which about 2000 are British. It is divided into two great families—butterflies and moths: the first including all lepidoptera that fly by day (*Lepidoptera diurna*), the second all that fly in the evening (*L. crepuscularia*), or by night (*L. nocturna*). It is in these insects that the phenomenon of metamorphosis or transformation is most strikingly manifested. Their first state is that of the egg, which is deposited by the parent upon the leaves of the particular plant suitable for food; after a while, this is hatched into a voracious larva called a caterpillar, which is usually of a long cylindrical shape, divided into twelve rings or segments, and of the same colour as the leaf it feeds on; at length this larva or caterpillar, as if tired of its condition, seeks an asylum either by wrapping itself up in leaves, burying itself in the earth, or spinning a silken web or cocoon, in which it may lie swaddled like a miniature mummy; and finally, out of this confined and usually torpid state, which is called the state of the pupa or chrysalis, there bursts forth a winged creature, to hover a few summer days over gardens and fields, deposit its eggs somewhere, and die. Of the cases under notice, the first three (Cases V-VII) are devoted to the butterflies, of which there is a most beautiful selection, intended chiefly to exhibit the different forms of their wings, and the peculiarities of their colouring. In these cases there is no specimen of the more gigantic foreign butterflies, some of which measure ten inches across the expanded wings. The two remaining cases (Cases VIII, IX) are devoted to the moths, and among the most remarkable of the specimens they contain are these:—(Case VIII). The sphinxes, or hawk-moths, so called from the sphinx-like attitude assumed by their caterpillars, and which are usually of a dull brown hue; the *Acherontia atropos*, or death's-head moth, the largest of all British lepidoptera, its expanded wings sometimes measuring four inches and three-quarters across, and which derives its dismal name from a skull-like patch on the back of its thorax—an emblem that, associated with its large size and its habit of emitting a squeaking kind of noise as it flies abroad in the evening, causes it to be regarded by the country-people with superstitious terror, although its chief known crime is, that it enters the hives of bees, and filches their honey; the humming-bird moth, or bee-bird, a species of hawk-moth that poises itself long over flowers, making by the movement of its wings a low deep musical sound; the ghost-moth, found in hop-grounds, where it commits great ravages; the leopard and goat-moths, which, in their larva state, feed on wood; various specimens of silk-worm moths with their cocoons; and (Case IX) the large owl-moth from Brazil, and many others of smaller size.

Dipterous Insects—Case X.—In this case there are specimens of the different tribes of two-winged flies, such as the muscidæ (house-fly, blue-bottle fly, &c.), of which there are about 1700 European species; the gnats, the gad-flies, &c.—insects that, though they frequently prove an annoyance to man, yet fulfil a function very important to society by removing animal and vegetable filth which would otherwise accumulate beyond all power of check. It was a saying of Linnæus, that three flies of the particular species named *Musca vomitoria* (the female of which will bring forth as many as 20,000 young at a time) would devour a dead horse sooner than a lion could.

Hemipterous Insects—Case X.—Here we have bugs of all sorts, an insect that appears to have been unknown in England at the end of the sixteenth century; the notonecta, or boat-fly, which rows along in the water on its back; the nepa, or water scorpion, the British species of which is of a dirty ash colour above, but is scarlet underneath; the cicada, or singing-insect, so often mentioned by the Greek poets as an emblem of cheerfulness, and whose image in gold was a favourite hair-ornament with the Athenians; and the lantern-flies of China, so called from the luminosity of a projecting part of their foreheads.

Spiders, and Apterous, or Wingless Insects—Cases XI, XII.—The spider tribe, or arachnida, whose differences from true insects have been already pointed out, includes the three great families of acari, or mites, scorpions, and spiders proper. Among the spiders in Case XI are some specimens of very large size, and by no means pleasant appearance, including the tarentula of Italy and the south of France, the bite of which produces very severe, and sometimes, it is said, fatal symptoms. Besides these are specimens of the curious nests formed by a particular species of spider, called the *Mygale cæmentaria*, which bores a long tortuous tube in the earth, lines it carefully with silk from its own body, and constructs for it a most ingenious lid or door, fitting tightly to the mouth, and falling by its own weight when opened. Of the scorpions (which differ from the spiders in having a more complex lungs or breathing apparatus, and in having their abdomen prolonged for the most part into a long tail armed with a sting)



Tarentula.

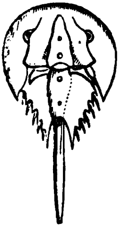
there are specimens from different countries; of the acari, or mites, there are specimens in Case XII, including the tick, so annoying to sheep and other animals from the obstinacy with which they cling to the skin, or bury themselves under it; and in the same case are some of the apterous, or wingless insects, which do not properly belong to the spider tribe at all—such as the *Iuli*, or millipedes, a South-American species which attains the length of seven inches; and the scolopendræ, or centipedes, the bite of the tropical species of which is said to be dangerous.

Cases XIII-XXIV—CRUSTACEA.—This order of articulata, the characteristic peculiarity of which is the possession of a hard-jointed shell or case enveloping a soft body, may not inaptly be regarded as enacting in the sea, and in water generally, the same functions which insects and spiders discharge on land. There are some crustacea, however, that inhabit the land either permanently or occasionally. In point of dignity of organisation the crustacea rank beneath the insect order: they exhibit some of the peculiarities that distinguish the higher radiata and the annelids, or lowest articulata—as, for example, the power of reproducing lost parts. If a crab has one of its limbs fractured, it throws it off at the joint, and in process of time it is replaced by another of the full dimensions. The provision by which crustacea are enabled to increase in bulk—which, it is evident, they could hardly do by merely secreting new matter at the soft parts of their skeleton, namely, the joints—is very remarkable. At particular seasons the animal falls sick, and retires to a sheltered spot; there its shell splits, and at length is shed off, the entire animal emerging from it quite naked and soft; for some time it is defenceless, and carefully avoids collision with any marine enemy; but soon a calcareous mucus is secreted over the body, which at last hardens into a perfect shell, larger than its predecessor, and capable of encasing the animal comfortably. The eyes of crustacea are compound—that is, consist of a number of minute lenses; they possess the sense of hearing, and probably also that of smell; taste and touch they may be assumed to have necessarily. The sexes are distinct in this order of animals; and the young, on emerging from the ova, or eggs, which the mother has deposited, appear to resemble to some extent the adults in their forms and habits, although it has been established that at least some of the crustacea do undergo a metamorphosis. Of the various methods that have been proposed for the purpose of classifying the immense numbers of crustacea distributed over the waters of the globe, it is unnecessary here to speak; the popular names of crabs, lobsters, and shrimps, being distinctive enough to mark the best-known tribes.

Crabs—Cases XIII-XX.—Among the numerous specimens of the crab-tribe arranged in these cases are the following:—Case XIII. Spider crabs, a native species, which have legs very long in proportion to their bodies; Case XIV. Rough crabs and common crabs, two of which have a number of oysters growing on their backs, thus showing either that crabs do not shed their shells every year, or that the oyster increases very rapidly in bulk; Case XV. Oval-bodied crabs; Case XVI. Fin-footed or swimming crabs from various seas; Case XVII. Telescope or long-eyed crabs, and land-crabs, of which there is a species that burrows in the ground, found in India 4000 feet above the sea-level, and another of similar habits in the plains of the Deccan, that may be seen swarming in the fields, hundreds at a time, some sitting cutting the green rice-stalks with their nippers, others waddling off backwards with sheaves bigger than themselves; Case XVIII. Square-bodied crabs, crested crabs, and Chinese fin-footed crabs; Case XIX. Porcelain crabs, with delicate china-like shells, and death's-head crabs, which usually form cases for themselves from pieces of sponge and shell; and Case XX. The hermit or Bernhard crabs, so called from their curious habit of taking up their solitary residence in the deserted shells of univalve mollusca, thus seeking a protection for their tails, which are long and naked. 'The species of hermit crab most abundant on our coast,' says Mr Patterson in his 'Introduction to Zoology,' 'is found in shells of very different dimensions, and from time to time leaves its abode as it feels a necessity for a more commodious dwelling. It is said to present, on such occasions, an amusing spectacle as it inserts the tail successively into several empty shells until one is found to fit. We learn from Professor Bell, however, that it does not always wait until the house is vacant, but occasionally ejects the rightful occupant, *vi et armis*.' Crabs, which are of all sizes, from the tiniest to a weight of ten or fourteen pounds, seem to feed, some on live fishes, &c. and others on all kinds of sea-garbage. Certain species are remarkably tenacious of life, having been known to live for weeks buried, and without food. It is in the crab-tribe that the fact of the metamorphosis of crustacea has been most distinctly perceived—a small peculiar-looking crustacean animal that had long passed for a distinct species under the name of *Zoea* having at length been identified with the young of the common crab before it had attained its full development.

Lobsters, *Crayfish*, *Shrimps*, &c.—Cases XX-XXII.—Of these the most remarkable are the tree lobster, which is said to climb cocoa-nut trees for the fruit; the scorpion lobster, which lives a great part of its life on land, and often destroys new roads in India by making excavations in them; and the alima or phyllosoma, found in the ocean of the tropics, and which are scarcely thicker than paper, and as transparent as glass. In the same case are specimens of the tropical limulus, or king-crab, remarkable for its long-pointed tail and large circular head.

Miscellaneous Crustacea and Cirripeda—Cases XXIII, XXIV.—In these cases, besides specimens of the *cyamus*—a peculiar parasitic crustacean which infests whales often in immense numbers, and is hence called the whale-louse—are some objects usually placed, not among crustacea, but in the separate class of articulata termed *cirripeda.* Among these are sea-acorns, and barnacles, or goose-shells, which two tribes, in fact, compose at present the entire class of cirripeds. Their appearance must be familiar to all who have ever lived on the sea-coast; the sea-acorn, or balanus, a curiously-constructed multivalve shell, to be seen attached in masses to rocks, piers, jetties, &c. and sometimes to shell-fish; and the barnacle, a mussel-like shell, dangling at the end of a tough fleshy stalk, and to be seen fastened in hundreds by means of these stalks to the unprotected bottoms of ships that have been long at sea, and to stray pieces of sea-borne timber. In their young state, both the balanus and the barnacle swim about freely like young crustaceans; and it is only at their maturity that they assume their characteristic semi-molluscous form, attaching themselves immovably to some chosen spot, and secreting a shell in which they become enclosed for the rest of their life. On undergoing this metamorphosis they part with their eyesight, no longer requiring it in the search for food, which is now procured by the action of beautiful feathery cilia or tentacula which they protrude at the openings of their shells—whence the name of the class. Examined within the shell, the cirripeds are found still to retain the articulated structure proper to the crustacea; and hence it might be given as a definition of the class, that its members have the bodies of crustacea enclosed in the shells of molluscs. An ancient vulgar notion, not yet extinct on our coasts, is, that barnacles become changed into geese.



Limulus.

Room V—Nests of Insects, &c.—The only other objects in the gallery that pertain to the class articulata are a few crustacea in spirits, and some nests of insects in the wall-cases of Room V. A number of specimens of wasps' nests from different countries particularly merit attention. 'It is a singular fact,' says Mr Patterson, 'that the nests of wasps are made of a material which we are apt to regard as a modern invention—paper. With their strong mandibles they cut or tear off portions of woody fibre, reduce it to a pulp, and of the *papier-maché* thus fabricated the cells, and often the covering of their habitations, are formed. The exterior of the tree-nests of some of the foreign species is perfectly white, smooth, and compact, resembling in appearance the finest pasteboard.' Many of the nests exhibited in Room V are of this wasp-made paper, on which one might write with ease. More curious still is a large tree-nest of a peculiar Brazilian species of wasp that stores up honey. It is of a rough, rounded shape, appears as if washed by heavy rains, and has hard knobs or protuberances on its outer surface, intended, it should seem, to repel the snout of any animal that might come smelling after the honey. In the case adjacent to that containing this curious wasp-hive are some specimens of timber exhibiting the secret but sure manner in which the termites, or white ants of the tropics, pursue their destructive ravages—eating out the inside, for instance, of the leg of a table without ever coming to the surface.

Wasp's Nest.

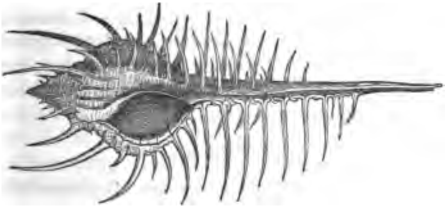
III.—Mollusca.

Besides some specimens in spirits in the wall-cases of Room V, the only objects in the Northern Zoological Gallery that relate to the sub-kingdom mollusca are a few shells and casts of shells deposited in the table-cases of Room I. Table-Cases III and IV in that room contain 'specimens of shells exhibiting the different size of different specimens in their adult age, the changes of form which occur in the shell during the growth of the animal, the changes which take place in the cavity of shells, the manner in which shells are repaired by the animal after any injury, and also how the animal covers any excrescence that attaches itself to a shell, or removes any part that may be in the way of its enlargement.'

The soft elastic skin which covers the pulpy body in all molluscous animals is called by zoologists the *mantle*. It was formerly supposed that the shell was but an exudation of calcareous matter from this part of the animal, held together by a kind of glue secreted along with it. Microscopic examination has shown, however, that the shell is itself a kind of membrane consisting of innumerable minute cells, differing in shape, size, &c. in different tribes. Even in the egg the embryo of the shell-bearing mollusc (all molluscs, it must be remembered, have not shells, and some have but small shells, covering only the heart or some other important organ) is provided with this beautiful appendage; when hatched it brings the thin covering along with it; and during the subsequent life of the animal the shell grows so as to correspond with the body, every mollusc being provided with the necessary apparatus for secreting exactly that kind of material and that kind of colouring matter required for its particular species of shell. The process by which the shell is gradually increased and kept in trim by the animal is thus described by Mr J. E. Gray:—'When the animal is hatched, it deposits on the edge of the little shell which covered its body in the egg a small quantity of mucous secretion. This dries, and is then lined with other mucous matter intermixed with calcareous particles; and when this becomes hardened, the animal again places on the edge another thin layer of the mucous secretion, and again lines it as before. The mucous secretion first deposited is called *periostaca*, and forms the outer coat of the shell, and is of use in protecting it from injury. The particles which produce the colouring of the surface are deposited while the shell is growing in size, immediately under the outer mucous coat or periostaca; and as these particles are only secreted by peculiar glands, the colouring is always disposed in a particular manner in each species.' Some molluscs, it must be added, which possess very small shells covering a part of their bodies when young, lose them altogether as they reach maturity. The majority, however, of such as have shells, retain them through life, and add to them in the above manner; and as the shell is secreted from the body of the animal, it follows that its interior must conform exactly in shape to the corresponding parts of the body.

Respecting the changes that molluscous animals make in their shells according to the necessities either of their own growing bulk or of accidental circumstances, the following is an interesting passage from Mr Patterson's Zoology:—'The changes of form which shells undergo as they approach maturity are sometimes so great that the full-grown specimen is altogether different from the appearance presented by the same shell in its immature state. Of this the common leg-of-mutton shell (*Apporhais pes pelicani*) of our shores and the beautiful tribe of cypreas furnish familiar examples. We have reason to believe that there is in all cases an effort on the part of the animal to accommodate the form of its mansion to the changes in the form or dimensions of its body. Professor Owen has stated that an oyster kept without food will frequently expend its last energies in secreting a new layer "at a distance from the old internal surface of the concave valve, corresponding to the diminution of bulk which it has experienced during its fast, and thus adapt its inflexible outward case to its shrunken body."' This, though wonderful, will appear more natural when we reflect that the shell, though apparently separate from the body, is not distinct from it, but is, on the contrary, a part of the whole animal, formed originally by a certain determination of the vital processes going on within its body, and still influenced by those processes, in some degree just as the hard bones of the human body are ultimately affected throughout life by the manner in which the blood circulates, and the other vital functions are performed in the softer parts. The changes that occur in the shells of molluscous animals, therefore, in their progress to maturity—as, for example, the thickening of the lips of the common *cowry*, so as to narrow the opening—are not very dissimilar in kind to the gradual induration of the bones of human beings, or the gradual closing of the sutures of the skull in young persons; while the more uncommon efforts of the same animals to repair injuries done to their shells, to remove parts they find incommodious, or to cover up excrescences, appear somewhat analogous to such exhibitions of the *vis medicatrix*, or inherent medicative energy of the human body as are seen in the growth of a stump where a limb has been cut off, or in the wonderful cures of wounds sometimes effected by nature itself.

On examining in what the corresponding energy in molluscous animals consists, we find that it is in the power they possess not only of originally secreting the matter of their shells, but also of absorbing such matter back into their bodies, to be re-expended as they choose. Thus if a *murex* wishes to cast off one of the numerous spines on the outside of its shell, it simply absorbs the stony matter at the junction of the spine with the body of the shell, so as to make a notch, and cause the spine to drop off; or if an oyster, or any other shell-fish, wishes to thin the walls of one portion of its mansion, it effects its object by sucking back, so to speak, the calcareous matter previously deposited at that part, applying the material perhaps to another part that is too thin; or, finally, if one of the numerous molluscs that have conical-topped shells wishes to remove the conical top, and pro-



Murex Tenuispina.

cure a reputation for humility by giving to its abode a more plain appearance, it has only to withdraw itself from that portion of the interior corresponding to the conical top, build a flat partition across, and eat out by absorption a circular groove round the portion of the old shell which it wishes to part with.

Specimens of shells thus thinned, thickened, repaired, bereft of spines, and decollated, as well as of malformations of shells, occasioned by diseases in the molluscs that owned them, are to be seen in the cases under notice. In the same cases are also deposited specimens of the large shells used by cameo-cutters, showing the parts of the shell from which the cameos are cut. The practice of using shells for cameo-engraving (a *cameo* is a gem engraved in relief, an *intaglio* is a gem engraved by indentation or cutting in) is comparatively modern, precious stones having been the only material used by the ancients whether for cameo or intaglio. Shell-engraving, however, under the name of *Conchylie*, is now carried on to a great extent in Italy, and especially at Rome. The method is to work the subject in relief in the white outer crust of the shell, cutting the surrounding parts off, so as to leave the pink or brown under-skin for the ground.

Shell-Cameo.

In Tables VII and VIII are some objects interesting to the geologist—namely, a series of plaster-casts of the interior of the shells of living mollusca, to assist in determining the casts of fossil species often found in rocks. Such determinations are frequently of the utmost consequence.

IV.—Vertebrata.

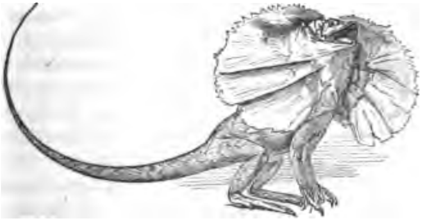
In the Northern Zoological Gallery are at present deposited a considerable proportion of the objects belonging to this the highest of the animal sub-kingdoms. They are thus distributed: —Room I. A series of skulls of the larger mammalia, with some specimens of birds'-nests; Room II. The collection of reptiles; Room III. A collection of some of the smaller mammalia; and Rooms III and IV. The collection of fishes.

ROOM I—SKULLS OF MAMMALIA AND BIRDS'-NESTS.—Although the casual visitor may find little to interest him in the series of skulls of different mammalia ranged in a portion of the wall-cases of this room, it is right that he should know in what the value of such a collection consists. The following passage from the article *Skeleton* in the 'Penny Cyclopædia' puts the matter in a very clear light:—'On the comparison of the skeletons of animals many of the most important facts in zoological science depend; for the bones being the least destructible of the tissues, are the most convenient organs to examine in the different classes of the higher animals; and in accordance with the rule of the exact adaptation of all the parts of an organised body to each other, the skeleton of each animal affords general indications of the characters of every other organ in its body. And not only so, but each bone, according to the same rule, affords indications of the characters of the rest of the skeleton, and therefore, though less certainly, of the other parts of the body.' If, for example, any individual skull out of all those ranged in the cases under notice were placed in the hands of an instructed zoologist, he would be able very easily to infer the form of the entire skeleton; this skeleton he would be able in imagination, or on paper, to clothe with flesh, skin, &c. until at length he should have built up, as it were, the whole animal as it was when alive; and from the structure thus built up, he would be able farther to infer, with tolerable accuracy, the habits of the animal, the nature of its food, the localities it preferred to live in, and so on. Nor is this possible only in the case of existing animals, of which the zoologist might have a preconception in his mind to assist him in his inferences—it is possible also with regard to animals that were never seen or even ascertained to exist except by this very process of inference. A skull, for example, or perhaps only a jaw-bone, might be dug up out of a rock; and this, if put into the hands of a Cuvier, might enable him to figure some animal of a kind never seen or even heard of before, but of whose existence in some ancient era of the world there would then remain no doubt. The science founded on this comparison of the different parts of different animals, and especially on the skeletons, is termed Comparative Anatomy.

In the same room, besides various specimens of birds'-nests, some of them highly curious, are specimens of the arbours of twigs formed by two species of Australian Bower Birds, the one ornamented with fresh-water shells and bones, and the other with feathers and land shells.

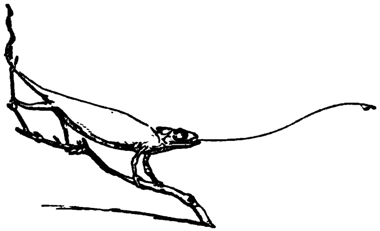
ROOM II—REPTILES.—This important class is zoologically defined as consisting of 'those quadruped, biped, and apod (without feet), oviparous (produced from eggs), and ovoviviparous (produced from eggs that burst in the act of being deposited), vertebrated animals that breathe by means of lungs principally, and are without hair, feathers, or mammæ.' To which it may be added, that all reptiles are cold-blooded—that is, have a low power of maintaining animal heat. The science that relates specially to such animals has received the name of *Herpetology*. It has been remarked regarding reptiles, that they present greater varieties of type than almost any other class of animals. Among quadrupeds, for example, there is an evident similarity of type between even the mouse and the elephant; among birds between even the wren and the eagle; but how totally unlike is a snake to its class-fellow the tortoise! For the classification of this very diversified department of the animal creation various schemes have been proposed; one of the oldest and most convenient for ordinary purposes is that which divides them into four orders—*Amphibia*, or frogs, called also *Batrachia; Ophidia*, or serpents; *Sauria*, or lizards; and *Testudinata*, or tortoises. The number of known species in each of these orders is very different; the number of species of amphibia being reckoned at 120, of serpents at 265, of lizards at 203, and of tortoises at 69, making in all 657 known species of reptiles. Of these the majority belong to the warm countries of the East; in Europe there are comparatively few. In Italy, for example, only 47 species are known, in France 31, in Great Britain 14, and in Ireland St Patrick has left but 5 as samples of the class. The collection in the museum, which consists partly of stuffed or dry specimens, and partly of specimens preserved in spirits, and which is believed to be the richest collection of reptiles in Europe, with the exception of that at Paris, is arranged according to the above-mentioned classification, except that, in accordance with a zoological view of the keeper, Mr Gray, the batrachia are regarded as a class apart from the other reptiles, and that those of the crocodile kind are placed as a separate order, intermediate in point of organisation between the lizards and the tortoises. These changes being made, the wall-cases of Room II divide themselves into five compartments, thus:—

Sauria, or Lizards—Cases I-VII.—Among the specimens of this interesting order are the following:—Cases I-III. The monitor lizards of Africa and India, so called on account of the notion entertained by the natives of both these countries that they give warning by their hissing of the approach of the crocodile, whose eggs they are accustomed to eat; on which account they are greatly venerated, as indeed they seem to have been by the ancient Egyptians. Case III. The heloderms from Mexico, 'which, unlike any other lizard, have a groove in the back of the teeth like serpents,' and which are said to be poisonous, although this is very probably a mistake. Case IV. The tropical American lizards, called *safeguards*, which often measure four or five feet in length, and are said to rob beehives by slapping them with their tails till the bees leave them; the crocodilurus, which has two keels in its tail, like the crocodile. Case V. The skinks and other allied genera of serpent lizards: these are usually small, and of a polished appearance; some of them have distinct and strong legs; while others, such as the so-called blind-worms, appear almost to want them. Case VI. The geckos, or night-lizards, which are inhabitants of the warm parts of both hemispheres, where they lurk in crevices during the day, and come out at night in search of their insect food; most of them have their feet so organised, that they can walk up a perpendicular surface, or even along a ceiling, back-downwards, like a fly; they have a sombre hue and broad flat heads, and hence probably the mistake that they are venomous: the iguanas, which are found only in America, where they live on fruits, leaves, &c.; they are very quarrelsome, and have frequent battles with each other; they have likewise the faculty of changing their colour very rapidly, and have a curious crest along their back. Case VII. The agamas and allied genera found only in the warmer parts of the old world and Australia; including the molochs, which are covered with large spines; the dragons of India, the only living representatives of the dragons of fable, and whose peculiarity, as compared with other lizards, consists in the possession of a pair of wing-like appendages to their small bodies, formed by extensions of the skin over the ribs, and capable of being opened or folded at pleasure—not adapted, however, for flying, but only for supporting the animal, like a parachute, as it leaps from branch to branch in quest of its insect prey; and the frilled agama, or chlamydosaurus, distinguished by a large folded frill, like a Queen Elizabeth's ruff, round its neck, which it raises when excited. This extraordinary saurian, one of the specimens of which, in the case under notice, is perhaps the most singular-looking object in the whole gallery, was discovered by Mr Allan Cunningham, the naturalist, at Careening Bay, Port Nelson, Australia, during the expedition of survey commanded by Captain King in the years 1818–1822. The fact is thus noted in Mr Cunningham's Journal:—'I secured a lizard of extraordinary



Frilled Agama.

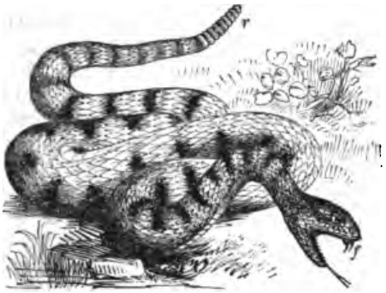
appearance which had perched itself upon the stem of a small decayed tree; it had a curious crenated membrane, like a ruff or tippet, round its neck, covering its shoulders; and when expanded, which it was enabled to do by means of transverse slender cartilages, it spreads five inches in the form of an open umbrella. I regret that my eagerness to secure so interesting an animal did not admit of sufficient time to allow the lizard by its alarm or irritability to show how far it depended upon, or what use it made of this extraordinary membrane, when its life was threatened.' On this specimen, which was sent to the museum of the Royal College of Surgeons, Mr Gray of the British Museum founded a new genus of saurians of the agama family. Specimens have been multiplied since. It is probable that the frill, when raised, may serve the purpose of frightening the enemies of the little animal, which appears to be extremely harmless, and to have no other means of defence. On the lower shelves of the same case are numerous specimens of the celebrated chameleon tribe, found in India, Africa, and some of the tropical islands. Sauroids of this tribe have prehensile tails; feet adapted for climbing, having two of their toes opposed, like thumbs, to the other three; eyes of such independent powers of motion, that they can look in the most opposite directions at once—one looking backwards, or sideways, or downwards, while the other is looking forward or upwards; and tongues capable of being darted out to an enormous length, and furnished with a viscous secretion or glue at their points with which they secure the insects they feed on. Chameleons are sluggish in their habits, and have great powers of abstinence; hence the story of their living on air. They are chiefly famous, however, for their power of changing colour. 'Much exaggeration,' says Dr Carpenter, 'has prevailed in the description of this phenomenon. All the colours of the rainbow, as well as white and black, have been represented as assumed by the animal. Its natural hue, when at rest and in the shade, seems to be a bluish-gray; from this it easily changes to a brownish-gray or into a green. Sometimes it fades to a pale gray, and sometimes it deepens to a dark-brown, but these are the extremes.' The chief cause of these changes of colour has been found by Mr Milne Edwards to consist in the



Chameleon.

alteration of the relative positions of two distinct layers of pigment contained in the skin. Among the specimens in the museum are some with their tongues distended to show their length.

Ophidia, or Serpents—Cases VIII-XIX.—Serpents are distinguished from lizards by the want of feet, by swallowing their food entire, and by casting their skin every year. They are divided into venomous and non-venomous; and it may serve to indicate the proportion in which these two classes exist in nature, that while one of the cases under notice (Case VIII) suffices to contain all the former, the latter occupies eleven (Cases IX-XIX). According to one naturalist there are 207 known species of non-venomous, and only 58 known species of venomous serpents. Among the poisonous serpents are the rattlesnakes, peculiar to America, with several detached specimens of the rattle (*r*), to show its mechanism; various specimens of the cobra di capello, and others of the poisonous snakes of India, most of which are of small size; and specimens of the vipers and adders of Europe and Africa, including the British viper, the only native species of serpent that is possessed of dangerous poisonous qualities. In all these snakes the poisoning organs consist of two sharp tubes, called fangs (*f*), attached to the upper jaw, and supplied by secreting glands with a fluid which, though perfectly innocent to the taste, is highly dangerous, and sometimes inevitably fatal, when injected into a wound. Among the harmless, or, more properly, non-venomous snakes, are (Cases IX-XVII) the water-snakes and the common ring-snakes of England; the coral-snake, which is marked with alternate black and red rings; various specimens of the snakes used by the Indian jugglers, some of which, however, are poisonous; and (Case XVIII) the genera allied to the boa, which alone of all serpents are furnished with rudimentary legs, and which kill their prey by crushing it within the folds of their body, assisting themselves by winding their prehensile tails round the branch of a tree or some other fixed support. Boas are found in India, America, and Africa. In Case XIX are specimens of the sea-snakes peculiar to the seas of Asia and New Holland. In some localities in the East Indies, says Dr Carpenter, 'they are by no means uncommon. They are



Rattlesnake.

chiefly known by the very decided vertical compression of the tail and hinder part of the body, which may thus be compared to the tails of fishes; hence they swim with considerable facility, occasionally coming to the surface to respire. They possess (some of them at least) poison-fangs, and are more dangerous than crocodiles or sharks to persons entering the water where they abound. One species lives in the rivers and canals of India, and attacks animals which come to bathe or drink, as well as devotees whilst performing their ablutions; others are confined to the sea, where they feed on fish. It is stated that they will occasionally make their way into boats.' Some of them attain a very large size.

Sea-Snake.

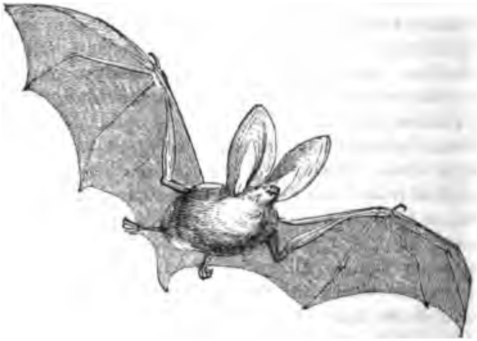
Testudinata, or Tortoises—Cases XX-XXIII.—These are divided into land-tortoises, embracing fifteen species; fresh-water tortoises, embracing forty-six species; and marine-tortoises, or turtles, embracing eight species. The land-tortoises, of which there are specimens in Case XX, are entirely herbivorous; their shell is very strong, and highly arched, and the legs can be withdrawn within it so as to be protected. Some of the species are used for food, particularly the gigantic Indian tortoise, which abounds in the Galapagos Islands, whence they are procured to victual ships. Some of these Indian tortoises grow to an enormous size: Mr Darwin was told of one that required six or eight men to lift it. When at liberty, land-tortoises bury themselves in the earth on the approach of winter, and remain torpid till spring. Their longevity is immense: one domesticated at Peterborough is said to be 220 years old, and to have outlived seven bishops of that see. In White's 'Natural History of Selborne' mention is made of a land-tortoise living in Sussex that had descended as an heirloom in a family there. 'When first awakened in the spring,' says Mr White, 'it eats nothing, nor again in the autumn before it retires; through the height of the summer it feeds voraciously, devouring all the food that comes in its way. I was much taken with its sagacity in discerning those that do it kind offices, for as soon as the good old lady comes in sight who has waited on it for more than *thirty* years, it hobbles towards her with great alacrity, but remains inattentive to strangers. Thus not only "the ox knoweth his owner, and the ass his master's crib," but the most abject reptile and torpid of beings distinguishes the hand that feeds it, and is touched with feelings of gratitude.' Of the fresh-water tortoises, called also terrapins, there are specimens in Cases XXI-XXIII. They live chiefly on animal food, such as frogs, fishes, &c. and are found in rivers and marshes in warm countries. One of the species that attain the largest size is the crocodile-tortoise or snapping-turtle of America, so called from its fierceness and the strength of its jaws, which have been known to bite through a stick half an inch in diameter with ease. Another species, the three-clawed terrapins (Case XXIII), are strictly carnivorous; they are to be seen on the Ganges feasting on the human bodies that float down the river. Some species of river turtles are fattened for food in Germany and Russia. But the turtle, whose flesh is so prized by epicures for the rich soup that it makes, is one of the marine-tortoises (Case XXIII, lower shelves), called the green turtle (*Chelonia midas)*, found chiefly within the tropics, where it feeds in shallow water, on sea-weeds, molluscs, and crustacea. It sometimes attains a weight of 1500 pounds; but the most valuable for soup are of smaller size, about four or five feet long, and from 500 to 800 pounds in weight. Although marine animals, the green turtles deposit their eggs (of which they lay about a hundred three times a year) on shore, covering them in the sand, and leaving them to be hatched by the sun's heat. They will travel hundreds of miles to procure a suitable locality for this purpose, generally preferring some island; the island of Ascension is much frequented by them, and there they are caught in great numbers at the proper seasons. As the best soup is made from one species of marine tortoise, so another species—the imbricated or hawk's-bill turtle of Arabia, *Chelonia imbricata* (Case XXIII, lower shelves), which is usually much smaller than the green turtle—yields the best tortoise-shell. Both the river and marine-tortoises are, on the whole, flatter in shape than the land-tortoises.

Loricata, or Crocodiles—Case XXIV.—Here we have specimens of the crocodiles proper, which are common to the old and the new world; of the caymans, or alligators, which are peculiar to America; and of the gavials, which are found in the Ganges and other Indian rivers. All these animals are serviceable as scavengers in the spots they inhabit, removing the carrion that would otherwise putrefy and taint the atmosphere; but wherever they exist they are a terror to the natives.

Batrachia, or Frogs—Cases XXV, XXVI.—In these cases are specimens of the toad, frog, and eft tribes; including the tree-frogs of some warm countries, which have their feet so formed that they can walk inverted on the smoothest surfaces; 'the bull-frogs of America; the horned toads of Brazil; the paradoxical frog of Surinam, the young or tadpole of which in its fish-like form is larger than its parent, and has been described as a fish; the *pipa* of Brazil, which deposits its eggs on the back of the male, who carries them for a certain period, when the young are emitted from the cells; the siren of Carolina, which looks like an eel with front legs; the proteus of the dark subterraneous lakes of southern Europe, which is of a pale-pink colour, and blushes when exposed to the light—of this there is a very accurate wax model to exhibit its appearance when alive.' The common notion that toads are poisonous is a mistake; the fluid they emit when caught is quite harmless. Some of the frogs in these cases are of very large size.

ROOM III—SMALLER MAMMALIA.—Twenty-eight of the wall-cases in this room are devoted, for the present at least, to the reception of the small mammalia belonging to these two orders: *chiroptera*, or bats, and *glires*, or dormice. The cases containing the bats are labelled XXV-XXIX; those containing the glires are the series from VI to XXII inclusive.

Chiroptera, or Bats—Cases XXV-XXIX.—These curious animals, though they fly in the air, are not to be regarded as birds, from which they differ not only in being mammalia—that is, in suckling their young, which they produce alive—but also in the very structure of the parts by means of which they fly; the wings of birds consisting of feathers, while those of bats are membranes of skin extended on a framework of bone. From experiments made by Spallanzani, who found that bats, even after they had been deprived of their eyes, could fly without striking against obstacles, or even threads placed purposely in their way, it would appear that their wings possess an extreme sensibility of touch. Bats walk on a level surface very awkwardly: the notion, however, that they cannot rise from the ground, is erroneous. There are many species of bats all bearing a family resemblance to each other (in England



Long-Eared Bat.

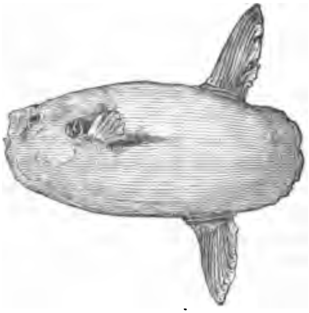
alone there are eighteen known species); and in the cases under notice one sees representatives of almost all these, including the curious leaf-nosed bats from Brazil, supposed to excel in the sense of smell; the vampire, or large blood-sucking bat from the same country, which sometimes attacks sleepers, and sucks their blood, but whose feats in this way have been exaggerated; and the different kinds of fruit-eating bats found in America and Australia, and sometimes called flying-foxes on account of their great size. The bats of temperate climates remain torpid during the winter.

Glires—Cases VI-XXVIII.—This order, which receives also the name of *rodentia*, or gnawing animals—so called from the manner in which they eat their food—is the most numerous of the orders of mammalia, embracing no fewer than 604 distinct species, or about two-fifths of the entire number of known mammalia. It is usually subdivided into seven families or tribes—namely, the *Muridæ*, or rat tribe; the *Castoridæ*, or beaver tribe; the *Hystricidæ*, or porcupine tribe; the *Leporidæ*, or hare tribe; the *Chinchillidæ*, or chinchilla tribe; the *Cavidæ*, or guinea-pig tribe; and the *Sciuridæ*, or squirrel tribe. The most striking characteristic of all these animals is the structure of their teeth. 'The molar or grinding teeth,' says Mr Patterson, 'have ridges of enamel variously arranged, which keep up the inequality of surface, as they wear less rapidly than the other portions. The incisor teeth with their chiselled edges are, however, more remarkable. If a carpenter could lay hold of the wishing-cap of the fairy tale, and desire to possess a chisel that would never wear out, and would never become blunt,' he would choose instruments made exactly on the principle of these incisor teeth of the rodentia. 'New matter is ever added at their base, the tooth is ever growing, the enamel is deposited on the outer edge, the soft or inner portions of the teeth wear away, and thus the bevelled or sloping edge of these most efficient tools is invariably preserved.' Of the muridæ, or rat and mouse tribe, which are not only the most numerous of the rodentia, comprehending 306 species, but also the most widely distributed over the globe, there is a large collection in Cases VI and VII; including curious specimens of the white mice, voles, jerboa-rats, which resemble kangaroos in shape, and in the enormous length of their hind-legs, spinous pouched rats from tropical America, &c. &c. In Cases VIII, IX, and X are specimens, some very curious, of the beavers, the cavies, and the porcupines; in Cases XI-XIV there is a fine collection of hares and rabbits from different parts of the world, including some beautiful white hares from the arctic countries; in Case XIV are some specimens of the chinchilla and its allies; while the range of Cases from XV to XXII is devoted to specimens of the extensive squirrel tribe, including the souslicks and marmots of North America and Europe.

ROOMS III AND IV—FISHES.—Fishes, the investigation of whose structure and habits forms the subject-matter of the department of natural history called Ichthyology, are usually divided into two great sections:—OSSEOUS FISHES, or those whose skeleton consists of bone, and CARTILAGINOUS FISHES, or those whose skeleton consists of cartilage or gristle. Osseous fishes are farther subdivided into six orders—namely, *Acanthopterygii*, or spiny-finned fishes—such as the perch; *Malacopterygii*, or soft-finned fishes, comprising three orders—namely, *M. Abdominales*, in which the ventral fins are attached to the abdomen behind the pectoral fins—such as the pike, the salmon, &c. a very numerous order, including the majority of fresh-water fishes; *M. Sub-brachiati*, in which the ventral fins are brought forward under the pectorals—such as the cod, the whiting, &c.; and *M. Apoda*, in which the ventral fins are wanting, as in the eel; *Lophobranchii*, or tuft-gilled fishes—that is, fishes having gills disposed in tufts, as in the pipe-fish, instead of hanging in regular fringes; and *Plectognathi*, having their jaws as if soldered together—as in the globe fish. The Cartilaginous fishes are subdivided into three orders:—*Sturiones*, sturgeons; *Plagiostomi*, sharks and rays; and *Cyclostomi*, round-mouthed fishes—such as lampreys.

Such is the ordinary method of classifying fishes; but at present, those in the museum are arranged only in the roughest possible temporary manner, under the three heads of spiny-finned fishes (Room IV, Wall-Cases I-XIII), soft-finned fishes (Room IV, Wall-Cases XIV-XIX), and anomalous fishes, including the cartilaginous (Room IV, Wall-Cases XX-XXVI); while a great number, left out of these cases, are placed either along the tops of the cases in the same room, or in a portion of the wall-cases of Room III. It is only possible, therefore, to name a few of the more interesting specimens, indicating where they are deposited.

Among the spiny-finned fishes are various specimens of the curious flying gurnards and flying sea-scorpions (Cases I-IV, Room IV); of the sword-fish (Case VII), distinguished for its long and sharp nose with which it kills its prey, and sometimes even pierces the timbers of a ship; of the dolphins (Case IX), which change colour so rapidly when they are caught; and of the curiously-shaped tobacco-pipe fish (Case XIII). Among the soft-finned fishes are specimens of the carp and other fresh-water fishes (Case XIV); of the pikes (Cases XV), remarkable for their voracity, their longevity, and the great size to which they sometimes grow; of the siluroid fishes; the callichthes, which are covered with rows of imbricate plates like scale armour; and the loricaria, whose scales form a coat of a similar description (Case XVI); and of the flat-fishes—such as turbot, flounders, soles, &c. (Cases XVIII, XIX); and the eels (Case XX). In the remaining cases of the same room are specimens of the spiny-globe fish, which can dilate their bodies almost to a globular shape by filling their stomachs with air (Case XX); and of the sturgeons, sharks, saw-fishes, rays, and torpedoes (Cases XXII-XXVI). Over the cases in the same room are placed various fine specimens of sword-fishes—one a flying sword-fish from the Indian Ocean; various pikes or weapons of the same fish, one of which was forced deep into the hulk of an oak-built ship; weapons also of the saw-fish, so called from their saw-like proboscis; and some specimens of large sharks, including the white shark, the most ferocious and dangerous of all the tribe. In Room III, also, are many specimens of fish that deserve notice; and in the lobby, at the entrance to the gallery from the side of the Eastern Zoological Gallery, is placed a large specimen of the short sun-fish, whose bulky body and almost comic expression of countenance invariably arrest visitors in their passage from the one gallery to the other.



Sun-Fish.

EASTERN ZOOLOGICAL GALLERY.

This gallery, which is far more spacious and magnificent than the one we have just quitted, does not present the same confused variety of objects, and may be examined by the visitor in a more complete manner with far less trouble. It contains, in addition to a series of horns of different kinds of deer and rhinoceri ranged along the tops of the wall-cases, two splendid collections that do honour to the museum—the one a collection of shells of molluscous animals, occupying a series of fifty large table-cases; and the other a collection of stuffed birds, occupying a range of no fewer than 166 wall-cases. At intervals along the sides of the room are also placed small table-cases, containing specimens of the eggs of the different species of birds that occupy the wall-cases near. We shall give a short account of the shells and the birds.

I.—The Collection of Shells.

Shells may be regarded in two aspects—either as beautiful and curious objects, valuable on their own account; or as skeletons of mollusca, valuable as connected with the study of the nature and habits of those animals. In the former light they may be considered as the objects of the science of *conchology;* for if this word is to be kept as the name of any distinct science at all, it can designate only that science (possible rather than actual) which should concern itself with the structure of shells independently of their origin, with their forms—as, for example, the peculiar class of curves that they exhibit, with their colours and tints, with their effects as native objects of *virtú*, and with the uses that might be made of them in the arts, whether as materials or as models of elegance. In the other aspect they are but a part of the materials of the science of *malacology* (*malacos*, Greek for *soft*)—that is, the science of the nature and habits of molluscous animals. They do not by any means constitute the whole of the materials for this science; for not only are there many molluscs that have no shells, but even in the case of shelled molluscs the anatomy of their soft parts is of at least as great importance for the purposes of classification as the structure of their shells. Indeed it is a common remark of zoological writers, that the enthusiasm of shell-collectors has rather impeded than assisted the progress of malacology. 'The shell-collector of former days,' says one such writer, 'looked upon his drawers, if they were rich in rare species or varieties, as containing an assemblage of gems; and indeed the enormous prices given for fine and scarce shells, joined with the surpassing beauty of the objects themselves, almost justified the view which the possessor took of his cabinet of treasures. But though they were the delight of his eyes, they were, in nine cases out of ten, little more to the owner of them: they were mere trinkets on which he looked dotingly, without knowing, and scarcely wishing to know, the organisation of the animal whose *skeleton* only was before him. This innocent trifling came at last to be viewed in its true light by some collectors worthy of better employment, who put off childish things, and went deeper into the subject. Lister, Adanson, Linnæus, Poli, Cuvier, Lamarck, De Blainville, and others, gave dignity to this department of zoology, and gradually raised the science to its proper rank.' This is perhaps overstated, for it is certain that a rational pleasure might be found in the contemplation of a cabinet of shells merely as a collection of beautiful objects and forms; nor is it quite clear that the dilettantism which would be content with this pleasure would be less respectable than the disposition which would see in a splendid collection of shells nothing more than a series of skeletons of molluscs. It were best, however, to combine the two modes of thinking; and while appreciating all the beauty of shells as objects of mere vision, to bring to the inspection of them all that the zoologist can tell us regarding their previous condition and history.

Proceeding on a distinction laid down by the great observer of antiquity, Aristotle, early modern zoologists, such as Ray and Linnæus, were accustomed to divide what we now call molluscous animals (with which they associated all the articulata, except insects and crustacea) into the two great classes of *Vermes mollusca*, or worms without shells, and *Vermes testacea*, or worms with shells. More recent zoologists, however, treating the possession or non-possession of a shell as a matter of less importance, and attending more to the structure of the whole animal, have proposed much more profound systems of classification. In this revolution Cuvier led the way by proposing the division of all molluscous animals into three sections: *Gasteropoda*, or belly-walking molluscs, so called because they creep on a fleshy disk placed under their belly—as in the snail; *Cephalopoda*, or head-walking molluscs, so called because their organs of locomotion are tentacula arranged in a circular manner round the head—as in the cuttle-fish; and *Acephala*, or headless molluscs, so called because they have no head distinguishable from the body—as, for instance, the oyster. Each of these sections contained both naked and testaceous molluscs. This original classification of Cuvier was subsequently modified both by himself and by his eminent contemporary Lamarck. Mr J. E. Gray of the British Museum is also known for his successful researches in this as in other departments of zoology; and in order to understand the arrangement of the collection of shells in his keeping, it is necessary to have some idea of the system of malacology on which he has founded it.

In this system molluscous animals are divided into five classes: —I. GASTEROPODA, already defined; the shells of testaceous animals belonging to which class are *univalve*—that is, composed of a single piece, as in the limpet. II. CONCHIFERA, embracing the greater proportion of the acephala of Cuvier; they are distinguished by having the mouth placed at the bottom of a bag-like mantle containing their bodies, and their shells are *bivalve*—that is, composed of two pieces, as in the mussel, the oyster, &c. III. BRACHIOPODA, a small class, comprehending the remainder of Cuvier's acephala; they have a *bivalve* shell; are stationary in their habits; and instead of feet, or any other organs of locomotion, are merely furnished with long ciliated arms, by the action of which in the deep waters where they live they bring their food within their reach. IV. PTEROPODA, also a small class, so called because they have a pair of fins on the sides of their head, by means of which they swim about in the water, never touching the ground, and consequently not requiring feet: the shells of such of them as are testaceous are *univalve*, and very thin and light. V. The CEPHALOPODA, already defined. The last three orders, it will be perceived, differ from the first two in wanting regular feet.

These five classes are farther subdivided, according to the structure of their gills or breathing organs, thus:—Class I. GASTEROPODA, into five orders—1. *Ctenobranchiata zoophaga*, or pectinated-gilled flesh-eaters, so called because they live on animal food, and have comb-shaped gills to breathe through; 2. *Ctenobranchiata phytophaga*, or pectinated-gilled plant-eaters, which live on vegetable matter; 3. *Pleurobranchiata*, which have gills composed of plates, and placed on the right side of the back; 4. *Gymnobranchiata*, which have naked gills; 5. *Pneumonobranchiata* or *Pulmonea*, which respire free air by means of a cavity under their mantle, acting like lungs, and are therefore either wholly or in part terrestrial. Class II. CONCHIFERA, contains likewise five orders—namely, 1. *Phyllopoda*, so called because their foot is lamellar and elongate; 2. *Cladopoda*, which have a large club-shaped foot; 3. *Goniopoda*, which have a more or less compressed angular foot; 4. *Pogonopoda*, which attach themselves to rocks, &c. by means of a bundle of fibres growing from the front of the base of the foot; 5. *Micropoda*, which have but a rudimentary foot on the lower side of the abdomen, and sometimes apparently none at all. Class III. BRACHIOPODA, is too small to require subdivision into orders. Class IV. PTEROPODA, includes two orders—1. *Thecosomata*, or such as have shells; 2. *Gymnosomata*, or such as are naked. Class V. CEPHALOPODA, also includes two orders—1. *Sepiophora*; 2. *Nautilophora*, the distinction between which will be pointed out hereafter.

In accordance with this classification of molluscous animals according to their structure, and serving the purpose of illustrating it, the shells in the collection are thus arranged:—

Cases I-XXX. The shells or skeletons of GASTEROPODOUS MOLLUSCA, comprising the greater proportion of known univalve shells, and arranged in five compartments corresponding to the five orders of this class—namely, Cases I-XV. Shells of *Zoophagous Ctenobranchiated Gastropods*; Cases XV-XXII. Shells of *Phytoptagous Ctenobranchiated Gastropods*; Cases XXII-XXIII. Shells of *Pleurobranchiated Gastropods*; Part of Case XXIII. Shells of *Gymnobranchiated Gastropods*; and Cases XXIV-XXX. Shells of *Pneumonobranchiated Gastropods*, including the majority of land and fresh-water shells.

Cases XXXI-XLVIII. The shells or skeletons of CONCHIFEROUS MOLLUSCA, comprising almost all known bivalve shells, and divided into compartments corresponding with the orders of the class, thus:—Cases XXXI-

XXXIV. Shells of *Phyllopodous Conchifers*; Cases XXXV, XXXVI. Shells of *Cladopodous Conchifers*; Cases XXXVII-XLII. Shells of *Goniopodous Conchifers*; Cases XLII-XLV. Shells of *Pogonopodous Conchifers*; and Cases XLV-XLVIII. Shells of *Micropodous Conchifers*.

Cases XLIX, L. The shells or skeletons of the three remaining classes—namely, the BRACHIOPODA, PTEROPODA, and CEPHALOPODA.

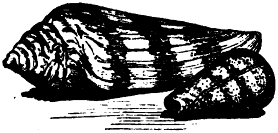
From this table it will be seen that the vast majority of shells are either univalves of the gasteropodous, or bivalves of the conchiferous class, the other classes being numerically inconsiderable.

Thus enlightened as to the general scheme of the arrangement, the visitor, even though he should not have exact conceptions in his mind corresponding to such scientific terms as *Ctenobranchiata*, *pogonopoda*, &c. will be able to derive much more satisfaction from the contemplation of the shells themselves than if he came among them not so prepared. Stopping, for example, at Case XV, he can say to himself, looking back on the previous fourteen cases which he has just examined, 'Here ends one order of the great class of gasteropodous univalves—that of the carnivorous gasteropods with comb-shaped gills. I see they form a very extensive order, being nearly a third of the entire collection;' and so on he may go, stopping at the termination of each class or order, and making similar remarks. A day or two thus spent in the Eastern Zoological Gallery would, with the assistance of a little reading, give one a considerable amount of general knowledge of the nature and structure of molluscous animals. We shall here go over the compartments separately, enumerating the families scientifically comprised in each order, and briefly noticing the most singular or interesting.

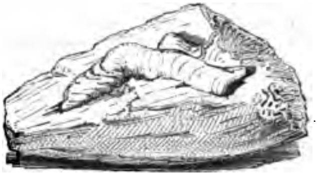
Cases I-XXX. SHELLS OF GASTEROPODA—UNIVALVES.—Of univalve shells, in general, it has been remarked that 'the primary form of all of them is resolvable into that of a simple hollow cone, of which the *top* is the tip or first-formed part of the shell, and the *base* the last formed.' All the varieties in this primary form observed in shells originate in the peculiarities of different molluscs as regards the manner in which they work at the base of their mansions. Some keep adding an equal breadth of new matter all round, making all points of the base equidistant, or nearly so, from the tip; and these preserve the pure conical form, as in the limpet. Others deviate to the right or the left in the direction in which they extend the base, producing what are called *whorls*, or convolutions, either parallel to each other, or not; and hence infinite diversities of the final form, in some of which, as in the common cowry in its mature state, it is difficult to discern the original or typical cone. These diversities are all examples how lavish nature can afford to be in forms of beauty, infinite in whim and graceful device, and yet never repeating herself.

Cases I-XV. SHELLS OF ZOOPHAGOUS CTENOBRANCHIATED GASTEROPODS.—The peculiar mark that distinguishes the shells of all zoophagous molluscs is the presence of a groove, or canal passing outwards from the interior, through which groove the animals, when alive, project a retractile proboscis armed with teeth, and capable of making round holes in the shells of such other molluscs as they preyed upon. The shells of the female zoophaga are usually larger than those of the male, and the form of both varies very much according to the roughness of the sea, and other circumstances affecting their native localities. Some of these shell-fish are used for bait, others for human food, to which purpose, indeed, many species belonging to this and the other orders of molluscs might be usefully applied, but that popular prejudice has restricted the favour to one or two. The families of the zoophagous gastropods, as enumerated by Mr Gray, are five in number—namely, *Strombidæ*, *Muricidæ*, *Buccinidæ*, *Volutidæ*, and *Cypræadæ;* and as the present order is by far the most numerous of any, it chances that we see shells of these families more frequently than most others.

Of the *strombidæ*, or stromb-shells (Cases I, II), one of the finest kinds is the large pink-mouthed stromb from the West Indies, in which are occasionally found pink pearls, that, if of good shape, fetch very high prices. There are some specimens of these pearls beside the mother shells. Other strombs, such as the spider's claws, have curious finger-like projections on the outer lip; and others, as the spindle strombs of the Red Sea, have the cavity of the lip filled up with calcareous matter as the animal grows. The next family, that of the *murices* (Cases II-VII), is an extensive and important one. To it belong the triton or trumpet-shells, the larger kinds of which are used as trumpets by the South-Sea islanders, and from one species of which, the angulated or gadrooned triton, our silversmiths have borrowed what is known as 'the gadrooned edge.' Another member of the same family is the genus of the rock-shells, or murices proper, many species of which have spinous protuberances and other ornamental excrescences; and one is believed to have yielded the famous Tyrian purple, so much prized as a dye by the ancients. The cone shells, so called from their smooth conical shape, likewise belong to this family; and of these some species—as, for instance, the beautiful variegated *Gloria maris*, or glory of the sea, from the Philippines—were at one time so rare and valuable, that single speci-


Gloria Maris.

mens sold for more than £100. Very different in appearance from these, but of the same family, are the turnip-shells (turbinella), the large and heavy kinds of which, especially such specimens as have their whorls in the reverse direction to the usual (a monstrosity sometimes seen in all species of univalves, and occasioned by some accidental circumstance affecting the embryo animal), are highly prized by the Chinese and Ceylonese Buddhists, who carve them, and use them as oil-vessels in their temples. To the family of the *buccinidæ* (Cases VII-XI) belong, in addition to the common whelk, such genera as the large helmet-shells (cassis) used by cameo-cutters; the beautiful harp-shells (harpa), so called from the resemblance of the regular ridges on their exterior to the strings of a harp, and the rarer kinds of which, having the ridges close together, and therefore named double-stringed harps, used to be extremely precious; also various genera of shells producing a purple dye, of which the best known is the purpura. But the most curious objects in the cases devoted to this family are the specimens in Case IX of the *magillus*. These shells are occasionally found imbedded in the substance of coral reefs, and resemble, both in shape and colour, a calcareous stalactite; indeed, when first discovered, they were supposed to be mere mineral secretions. Afterwards, when their animal origin was ascertained, they were placed in the class annellata of the articulated subkingdom, as allies of the tubicolous serpulæ. It is clearly proved now, however, that they are the shells of gastropodous molluscs of the family buccinidæ. When young, the animal has a spiral univalve shell of the ordinary form; but as it lives on corals, it is obliged, in order to prevent itself from being enclosed in the growing reef, to project a straight calcareous tube from the mouth of this shell, along which tube it creeps, continually filling the useless space behind it with calcareous matter. The family of the *Volutidæ*, or volutes (Cases XI-XIV), includes such shells as the large melon-shells (cymbium) used by the Chinese as vessels for holding liquids, and the various kinds of mitre-shells, as the bishop's mitre, the abbot's mitre, the papal crown, &c. so called from their resemblance in shape to the originals of those names. Among the *cypræadæ*, or cowries (Cases XIV, XV), which are the shells so often used as ornaments to mantelpieces, are specimens of the small shells of that name that are employed as a currency among the nations of Africa, as

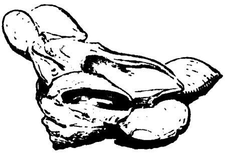


Magillus.

well as of a species called the orange cowry, much used as an ornament by the Friendly islanders.

Cases XV-XXII—SHELLS OF PHYTOPHAGOUS CTENOBRANCHIATED GASTROPODS.—These shells want the groove that distinguishes the shells of the zoophagous gastropods. They are divided according to the position or structure of their eyes into two sections—the PODOPHTHALMA (Cases XV-XIX), or such as have their eyes placed on small pedicles at the back inner angle of their tentacles or feelers; and the ERIOPHTHALMA (Cases XIX-XXII), or such as have their eyes otherwise placed. Each of these sections embraces a number of families: the PODOPHTHALMA eleven —namely, *Turbinidæ*, *Trochidæ*, *Stomatellidæ*, *Haliotidæ*, *Fissurellidæ*, *Dentalidæ*, *Lottiadæ*, *Neritidæ*, *Ampullaridæ*, *Ianthinidæ*, *Atlantidæ*; and the ERIOPHTHALMA thirteen—namely, *Naticidæ*, *Littorinidæ*, *Truncatellidæ*, *Velutinidæ*, *Paludinidæ*, *Pyramidellidæ*, *Tornatellidæ*, *Valvatidæ*, *Vermetidæ*, *Vanicoroidæ*, *Capulidæ*, *Calyptræadæ*, *Phoridæ*. From the number of these families, compared with the space the whole order occupy, it will be perceived that each family can embrace but a small number of genera.

Of these families specimens are to be seen in the cases abovementioned, some very remarkable for their beauty—as the fine-speckled green imperial turbo from New Zealand, and the whole family of the *haliotidæ*, or ear-shells (Cases XVI, XVII), the interior of which looks like splendescent mother-of-pearl; others for their peculiar form—as the scalaria, or ladder-shell, called by the Dutch *wentletrap*, from its resemblance to the winding-stair of that name. One species of the family of the *trochidæ*, or top-shells (Cases XV, XVI), called the *Livona aurea*, or gold button, produces a beautiful light-golden pearl. The family of the paludinidæ (Case XXI) includes what are called pond-snails; that of littorinidæ (Case XX) the periwinkles. The *ianthinidæ*, or purple-floating snails (Case XVIII), are worthy of notice. 'They possess a peculiar floating apparatus, composed of a number of foam-like vesicles attached to their foot, and apparently formed by it. When the sea is calm, these beautiful animals may be seen floating over it in considerable numbers; but when rough, they sink, absorbing, in some unknown manner, the air which these vesicles contain. When alarmed, they emit a deep-blue fluid, which tinges the sea around, and hides them from their enemies.' Other families worthy of notice are the vermetidæ (Case XXII) and the phoridæ (Case XXII). The vermetus-shell is an elongated tube educed from a real shell, and is consequently analogous to that of the magillus. It is more spiral in its form throughout, however, and is always found in groups, like a deposit of serpulæ attached to marine bodies, such as sponges, rocks, &c. Unlike the magillus, the vermetus, in creeping forward in its tube, does not fill up the abandoned portion with solid matter, but only throws a partition across to hide it. The *Phorus*, or carrier-mollusc, is so called because 'it has the peculiarity of attaching to the outer surface of its shell, as it enlarges in size, stones, fragments of other shells, coral, and other marine substances, whence it has been also called respectively the "conchologist" and the "mineralogist," as shell or mineral preponderated.'


Phorus.

CASES XXII, XXIII—SHELLS OF PLEUROBRANCHIATED GASTROPODS.—This order comprises five families: namely, *Ballidæ* (bubble-shells), *Aplysiadæ* (sea-hares), *Pterotracheidæ*, *Umbellidæ*, and *Pleurobranchidæ*.

The *aplysia*, or sea-hare (Case XXIII), so called from the resemblance of its upper tentacula to the ears of a hare, is often found on our shores: it is a highly-organized mollusc, and has the power of secreting a deep purple fluid, so as to obscure the water when it is alarmed or attacked. It was formerly believed that the touch of this animal would cause the hair to fall off from the human body, and that a deadly poison might be decocted from it; but the notion is quite unfounded. To the family of the pterotracheidæ, all the members of which swim with the shell downward, belongs the *carinaria*, a singular mollusc found in tropical seas, and whose thin and fragile shell (Case XXIII) is called the glassy nautilus, from its resemblance to the shell of the cephalopod argonaut, or paper-nautilus, afterwards to be described.

CASE XXIII—SHELLS OF GYMNOBRANCHIATED GASTROPODS.—In this small order are included six families—namely, *Doridæ*, or sea-lemons, *Tritonidæ*, or tritons, *Placobranchidæ*, or sea-cats, *Phyllidiadæ*, *Patellidæ*, or limpets, and *Chitonidæ*, or sea wood-lice. All these families are marine, and 'being adapted to breathe water at any depths, and also in many instances to swim with facility, they are often found at a great distance from land. Those that swim do so usually in a reversed position, the foot being turned upwards; this is made concave by muscular action, so as to serve as a kind of boat, the buoyancy of which keeps the animal at the surface without effort.' The doridæ and tritonidæ are of this kind: they are found in British seas. The *patellidæ*, or limpets, are familiar to every one; but few that see them sticking sluggishly to a rock left dry by the receding tide, know how alertly they can crawl over its surface when it is covered by the water. This they do by alternately elongating and contracting their fleshy belly or disk just as the slug. They live on sea-weeds, &c. rasping down their food by a long ribbon-like tongue covered with hooks or spines. Closely allied to the limpets, but differing from them in having a shell composed of a number of jointed plates, are the *chitons*, or sea wood-lice, and the *chitonella*, or sea-caterpillars—molluscs that remind the zoologist more than any others of the peculiar appearance of articulated animals. Chitons are sometimes found as large as four inches.

CASES XXIV-XXX—SHELLS OF PNEUMONOBRANCHIATED OR PULMONEOUS GASTROPODS.—This is a pretty extensive order, comprising as it does all the free air-breathing gastropods, whether the wholly terrestrial molluscs, or those aquatic molluscs (inhabiting ponds, streams, or the sea-margin) that come to the surface to breathe. The families are enumerated as eleven—namely, *Arionidæ*, *Helicidæ*, or snails, *Veronicellidæ*, *Onchidiadæ*, *Auriculidæ*, *Limnæadæ*, *Amphibolidæ*, *Siphonariadæ*, *Gadiniadæ*, *Cyclostomidæ*, *Helicinidæ*. Of these six—namely, the first four, and the last two—are terrestrial; the others are aquatic.

Of the terrestrial molluscs of this order by far the most important are the *helices*, or snails (Cases XXIII-XXVI.) Many species of this family, however, have either no shell or a merely rudimentary one. Besides serving as food for birds, &c. in all countries, land-snails, or at least a certain species of them, are in some used as an article of human diet. Among the Romans they were esteemed a delicacy, and even in England they seem at one time to have been eaten; one old writer bearing testimony that when 'boiled in spring-water, and seasoned with oil, salt, and pepper, they make a dainty dish.' Allied to the helices are some curious genera of land-shells, such as the *bulimi* and the *achatinæ*, which deposit a large egg like that of a bird. Specimens of such eggs are exhibited in Cases XXVII-XXIX. Among the fresh-water shells of the same order the most remarkable are the *Limnæi*, or pond-shells, with their allies the *Planborbes*, or coil-shells, so called from their shape, and the *Ancyli*, or fresh-water limpets; and the shells of the genus of the *Auriculidæ* called *Carychia*, the most minute of British land-shells. The *Amphibolidæ*, *Siphonaridæ*, and *Gadiniadæ*, are marine families.

Cases XXXI-XLVIII—SHELLS OF CONCHIFERA—BIVALVES.—The conchiferous molluscs, whose shells are uniformly bivalve, are, on the whole, lower in point of organization than the gasteropoda. Not only have they no distinct head (although some of them, from their sensibility to light, are believed to have visual organs or something analogous), but they are not in general so well furnished with the means of locomotion as the gastropods. Many of them, indeed, have a fleshy tongue-like projection, called a foot, which they can protrude downward between the two valves of their shell; and some contrive, by the assistance of this foot, to move pretty nimbly along the sand or the surface of a rock, while others swim about freely during their whole lives; but in the majority the foot is used for other purposes than those of locomotion, the animal not moving at all, but burying itself in holes, or attaching itself more or less loosely to the bottom of the sea or to a rock by means of the *byssus*, a band of hair-like filaments proceeding from their bodies. All conchifers, whether stationary or locomotive, procure their food by the ciliary action of the fringes of their gills, causing a constant current of water towards the mouth, where, by means of the feelers, the nutritious particles it contains are selected, and whatever is unnutritious is rejected. The bivalve shells of the conchifers, like the univalves of the gastropods, are formed and kept in trim by the animal itself, the only difference being, that the conchifer has to make its enlargements to the edges of two shells at the same time. 'If one of the valves of a bivalve shell—as, for instance, an oyster or a mussel—be examined, it will be seen to consist of a number of layers, of which the outer is the smallest, each inner one projecting beyond the one which covers it.' The valves are usually connected by an elastic ligament which the animal can tighten or slacken at pleasure, thus shutting or opening the shell. As regards shape, size, and colour, bivalves present the same abundant varieties as univalves. Some have thick shells, others thin; some are oval, others heart-shaped, others tongue-shaped, others fan-shaped; some have the valves equally, others unequally deep; some have a smooth, others a scaly, others a rough, others a ribbed, and others a tesselated exterior; some are extremely minute, others of great size; some are white, others blue, others variegated, and so on.

Cases XXXI-XXXIV—SHELLS OF PHYLLOPODOUS CONCHIFERS.—In conchifers of this order, the foot spoken of above is long and muscular, so that by bending and suddenly straightening it, they can take short leaps: in this way they move about with considerable agility. By many bivalves of this order the foot is also used as a digging instrument, the animal burying itself in the sand or mud, and breathing through long elastic tubes that reach up into the clear water. The order includes six families—namely, *Veneridæ* (Venus-shells), *Cyrenidæ*, *Cardiadæ* (cockles), *Mactridæ*, *Mesodesmidæ*, *Tellinidæ*. Of these the cardiadæ are the best known; and in them the foot is so developed, that a cockle will often, by means of it, jerk itself out of a boat back into the water.

Cases XXXV, XXXVI—SHELLS OF CLADOPODOUS CONCHIFERS.—This is a very curious order of conchifers, most of its members being distinguished by their habit of boring or digging, a process in which they are assisted by the peculiar formation of their foot, from which they derive their name. Ten families are enumerated as belonging to the order—namely, *Pholadæ*, *Gastrochœnadæ*, *Solenidæ*, *Anatinidæ*, *Myadæ*, *Corbulidæ*, *Pandoridæ*, *Selenomyadæ*, *Galeommidæ*, *Saxicavidæ*. Of these families one of the most characteristic is that of the *solenidæ*, or razor-shells, which, when the valves are shut, are of a long, flattened, cylindrical shape, and open at both ends. Projecting its strong pointed foot at one of these ends, the *solen* can work itself down into the sand with great rapidity, while at the upper end its respiratory tubes are shot out to bring the water to its gills. Of the *pholadæ*, the shells of which are sometimes called multivalve, because, in addition to the two chief portions, they have a number of smaller accessory pieces, some bore in hard mud, others in wood, and others in rocks. 'Their action,' it is said, 'seems purely mechanical. They fix themselves firmly by the powerful foot, and then make the shell revolve; the sharp edges of this commence the perforation, which is afterwards enlarged by the rasp-like action of the rough exterior; and though the shell must thus be constantly worn down, yet it is replaced by a new formation from the animal, so as never to be unfit for its purpose.' The typical bivalve of this family is the *pholas*, which bores into limestone rock and other hard material, and often commits ravages on the piers, breakwaters, &c. that it chances to select for a home. In the same family Mr Gray ranks the *teredo*, or wood-boring mollusc, whose ravages on ships, piles, wooden piers, &c. at sea, resemble those of the white ant on furniture, joists of houses, &c. on shore. Perforating the timber by exactly the same process as that by which the pholas perforates stone, the teredo advances continually, eating out a contorted tube or gallery, which it lines behind it with calcareous matter, and through which it continues to breathe the water. Specimens of wood thus drilled by the teredo are to be seen in the cases under notice. The metal sheathing of ships is an effective protection of their timbers against the teredo; but they have done much damage in dockyards, &c.

Cases XXXVII-XLII—SHELLS OF GONIOPODOUS CONCHIFERS.—In this order Mr Gray enumerates twelve families—namely, *Chamidæ*, *Etheriadæ*, *Carditidæ*, *Crassinidæ*, *Crassatellidæ*, *Isocardiadæ*, *Lucinidæ*, *Unionidæ*, *Iridenidæ*, *Mycalopodidæ*, *Trigoniadæ*, *Arcadæ*. Of these, by far the most numerous and important is the family of the *unionidæ*, or pond-mussels (Cases XXXVIII, XXXIX, XL). These fresh-water bivalves 'are remarkable for the pearly lining of their interior, and for producing small pearls sometimes in considerable abundance. Some species of unio are common in the lakes and rivers of Britain; but the greater number are peculiar to North America; many of these are remarkable for their size and colour.' Some bivalves of this class resemble the cladopods in their habits.

Cases XLII-XLV—SHELLS OF POGONONOPODOUS CONCHIFERS.—This order comprehends six families—namely, *Tridacnidæ, Dreissenidæ, Mytilidæ, Crenellidæ, Pinnidæ, Aviculidæ;* four of which—the tridacnidæ, the mytilidæ, the pinnidæ, and the aviculidæ—deserve special mention. The tridacnidæ are remarkable for producing one species—the *Tridacne gigas*, or giant clam-shell—which is the largest of known bivalves, and is a native of the Indian Ocean. Some of them attain the weight of 600 pounds; hence the stories of Eastern shell-fish so large as to furnish a meal for a whole regiment. 'When young, the animal attaches itself to rocks by means of its tendinous foot, which serves as a sort of byssus; but when its shell becomes so massive that it is in no danger of injury, it detaches itself, and the groove of the shell is filled up. The valves are sometimes used to receive water from small fountains, &c. and on the continent are employed as reservoirs of holy water in churches. The foot has a structure so tough, that to separate the shell attached by it, it is necessary to chop it with a hatchet like a cable. The animal being edible, is sought by the natives of the islands near which it lives, especially the Moluccas. It is usually seen in water a few feet deep, with its valves slightly separated; a pole is pushed down between them, which alarms the animal, and causes it to draw the valves together. The pole is thus firmly grasped, and by this the shell may be lifted from its bed.'*

Specimens of these immense shells are deposited under one or two of the table-cases. Of the *mytilidæ*, or mussel tribe, the best-known species is the edible mussel. Like the tridacnæ, the mussels live in a state of anchorage to a spot, mooring themselves by means of the *byssus*, or beard. This byssus of the mussel has been in some cases applied to a singular use—that of giving solidity to marine mason-work, in places where the tide runs with such rapidity that ordinary mortar will not hold. The method is to fill up the interstices of the mason-work with live mussels: the animals cling where they are inserted, and by fixing their tough *byssi* along the crevices, protect them from the action of the tide, far better than any cement could do. This strange device is practised at a particular bridge at Biddeford in Devonshire; and there is a special act rendering it felony to remove the mussels from that bridge, except by the order of the trustees. Allied to the mussels are the *pinnidæ*, or wing-shells, whose *byssi* are so long, and of such a tough silky texture, that the article is collected on the shores of Italy, &c. to be manufactured either by itself or in conjunction with silk into gloves, stockings, &c. Even dresses have been made of this marine silk, and sold to great personages at enormous prices. The *aviculidæ* are the chief source of pearls, and hence are usually, although not very correctly, called pearl-oysters. Pearls (which are, in reality, diseases in the shell-fish that produce them, being nothing else than extraordinary secretions of matter determined to one spot by the presence there of some particular irritant —as, for instance, a grain of sand, or a small worm-hole; while the pearly patches called mother-of-pearl indicate that the irritation has extended over a large surface) are found in many other bivalves as well as in univalves: but those obtained from the aviculidæ of the coasts of Ceylon and the Persian Gulf are most valued. It has been proposed to produce pearls artificially of any shape wanted, by inserting small nuclei of the required shape into the shell-fish, and leaving them in their native beds till the nuclei are incrusted with the secretion; but this expedient, questionable in its nature, does not appear to succeed in producing pearls of much fineness.*

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* Treatise on Zoology, Chambers's Educational Course.

Cases XLV-XLVIII—SHELLS OF MICROPODOUS CONCHIFERS. —In this order five families are reckoned: namely, *Pectinidæ*, *Spondylidæ*, *Ostreidæ*, *Placunidæ*, and *Anomiadæ*. Of these the *ostreidæ*, or oyster tribe, are the most familiar. Aggregating in myriads in great beds, called oyster banks, these molluscs procure their food, without stirring, by the ciliary action already described. They produce their young in little adhesive masses that resemble drops of grease, and are called by the fishermen *spats*. The fecundity of the oyster (as many as 1,200,000 eggs having been found in a single individual), and the rapid growth of the young, account for the fact, that some species are not exhausted by the great demand that exists for them as an article of food. The other families are more or less allied to the oysters, but differ in certain particulars—the pectins in having a ribbed exterior, and projections called ears close by the hinge, as well as in being locomotive; the spondyli in having a more complex hinge; and the anomiadæ in having, in addition to their two oyster-like valves, a third horny or shelly plate on one side, by means of which they attach themselves.

Cases XLIX, L—SHELLS OF BRACHIOPODA, PTEROPODA, and CEPHALOPODA.—Although these cases appear but as an appendage to the foregoing (XLVIII), the circumstance that they contain the representatives of three entire classes of the molluscous sub-kingdom makes them worthy of special attention.

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* For an interesting and instructive account of Pearls and Pearl-fisheries, see No. 167 of 'Chambers's Miscellany of Useful and Entertaining Tracts.'

SHELLS OF BRACHIOPODA.—The shells of the brachiopoda are in appearance common bivalves, but the organization of the contained molluscs is very different from that of the conchifers. 'They have not only several muscles provided for the closure of the shell, but another set to open it—an organization which no other bivalves possess. The most peculiar part of their structure, and that from which they derive their name, consists in the presence of two very long arms or tentacula between the origin of which the mouth is situated. These can be projected to a considerable distance from the shell, or drawn in and coiled up spirally within it.' Though fossil brachiopoda are numerous, the existing species of the class are few; and these are distributed among six tribes or families — namely, *Terebratulidæ* or lamp-shells, the *Lingulidæ*, or duck mussels, *Productidæ, Thecedeidæ, Craniadæ, Discinidæ.* Specimens of these families are to be seen in Case XLIX. The terebratulæ and lingulæ are attached to solid substances by means of a foot-stalk, the others by one of their valves. Most of these brachiopoda, especially the terebratulæ, live at immense depths in the ocean, sometimes as far as ninety fathoms below the surface, and the peculiarities of their organization are connected with this circumstance. 'In the stillness pervading these abysses,' says Professor Owen, 'they can only maintain existence by exciting a perpetual current around them, in order to dissipate the water already loaded with their effete particles, and bring within the reach of their prehensile organs the animalcula adapted for their support.' This they do by means of the cilia with which their arms are fringed.

SHELLS OF PTEROPODA.—This is a small class, divided into two orders, the one including such as have, the others such as want shells. In the former there are reckoned four families—*Cleodoridæ, Limacinidæ, Cuvieridæ,* and *Cymbuliadæ.* The shells of these small animals are extremely slight and delicate, so as to offer no impediment to their free motion through the water by means of the wing or fin-like appendages from which they derive their name. They spend their lives in swimming, and never touch the bottom, having, indeed, no organs for creeping on a solid surface. They are frequently to be seen on the surface of the sea in immense shoals; and on the whole bear, in their structure and habits, the same relation to other molluscs that insects bear to other articulata, or birds to other vertebrata.

SHELLS OR SKELETONS OF CEPHALOPODA.—The cephalopoda, so called from their general structure and aspect (which is that of a rounded muscular bag or sac, containing the viscera, and having attached to it a distinct head furnished with well-developed eyes, and surrounded with numerous powerful arms or tentacles), are the most highly-organized of all molluscs, approaching in some respects to the class of fishes, with which, indeed, as is indicated by their popular name of 'cuttle-fishes,' they have usually been confounded. These extraordinary marine animals, which are to be found in all seas, swim with their heads downward, using their tentacles or arms both as instruments of locomotion and as organs for seizing their prey. For both these purposes they are admirably adapted, each arm being provided with numerous suckers or cupping-glass-like instruments, by means of which they can attach themselves firmly to any surface, or lay hold of any floating body. The suckers are worked on the principle of the cylinder and piston, the animal making a vacuum when it chooses by raising a sort of fleshy piston in each sucker, and lets go its hold by again depressing the piston. So powerful is the grasp that the animal can thus take, that it is easier to tear away the limb itself than forcibly to detach the suckers from the surface to which they adhere; and even in the dead animal the suckers have not lost their power. Against such an apparatus the strongest fish, or the most hard-shelled lobster, is without the means of resistance. Wreathing its many arms round its victim, the agile cuttle-fish instantly applies its suckers, and then drags the imprisoned body towards its mouth, to be torn slowly in pieces by means of its hard parrot-like beak. Of all marine animals, the cephalopods are probably the most voracious and destructive, and their ravages doubtless serve to repress the undue multiplication of crustacea and smaller fishes.

Although all cephalopods agree in certain general characteristics, there are many kinds of them, differing from each other in important particulars—as, for example, in the number of their arms or tentacles, which varies in different species from eight or ten to as many as a hundred, and in the structure of their gills, &c. Various classifications of cephalopods have accordingly been proposed; but the most natural, and that adopted by Mr Gray, is the one which divides them into two orders—SEPIOPHORA, or ink-bearing cephalopods, and NAUTILOPHORA, or nautilus-bearing cephalopods. The former have no external shell or hard covering, but as a compensation they have the power of squirting out a dark fluid resembling ink from an ink-bag within their bodies, thus obscuring the water all round them, and affording themselves, when necessary, the means of escape. The cephalopods of the other order are always found enclosed in a peculiarly-shaped spiral shell.

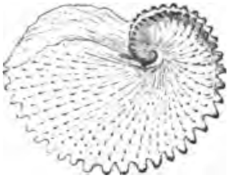
Of the SEPIOPHORA there are three existing families—the *Sepiadæ*, or cuttle-fishes proper; the *Octopodidæ*, or eight-armed cephalopods; and the *Spirulidæ*. Of the *sepiadæ*, the best-known kind is the sepia, or common cuttle-fish, of which such large numbers are found on all fishing-coasts, much to the annoyance of the fishermen. Their bodies are usually broad and squat; and of their tentacula, of which there are ten in all, two are much longer than the rest. These two have suckers only at the extremities, while the others have them along their whole length. Some species of sepiæ, as indeed of other cephalopods, have the power not only of secreting a dark inky fluid, but also of changing the colour of their bodies to that of surrounding objects. The sepiæ found in our seas are small; but there are authentic accounts of enormous sepiæ having been seen in the Indian seas, where the natives regard them as monsters, and dread them more than sharks. The valuable pigment known to artists as *sepia* is furnished by the ink-bags of an Indian species of cuttle-fishes. The same animals, though destitute of any external shell, have a kind of internal skeleton, of which the hardest portion is a peculiar bony plate at the back of their mantle. It is of an oval form, and used for making erasures, and from it the article called 'pounce' is manufactured. Specimens of these bones of the cuttle-fish are exhibited in the cases under notice. By the ancients the flesh of the cuttle-fish was esteemed a great delicacy; and it is still eaten in some countries, though not in Great Britain. The loligo, called also the calamary, or squid, is another of the sepiadæ, differing from the true sepia in having a more slender body of a long cylindrical shape, and in swimming by small fin-like appendages at the end of its sac, that give it some resemblance to a fish. The cartilaginous lance-shaped skeletons of these animals are sometimes called *sea-pens;* specimens are placed beside the bones of the sepia. Of the *octopodidæ*, so called because, instead of ten tentacula, like the sepiadæ, they possess only eight, the most characteristic specimen is the common *octopus*, or *poulp*, of European shores, 'which has arms six times the length of the body, and each furnished with 120 pairs of suckers. It can leave the water and creep over the beach, taking hold of the ground before it by the extension of its arms, and then dragging the body towards the points at which the suckers are attached. Many marvellous stories are related in regard to the size which this

Sepia and Bone.

animal occasionally attains. According to Aristotle, there are species whose arms are about six feet in length. It is probable that some of the accounts of the *kraken*, a gigantic sea-monster reported to have been seen by many navigators, are to be referred to large species of octopi.' Of the spirulidæ little is known; specimens of their peculiar internal shell are placed in the cases under notice; and beside them are placed specimens of the well-known fossils called *belemnites*, which are supposed to have been part of the internal bone of extinct species of cuttle-fishes, analogous to the sepia.

Of the nautilophorous cephalopods, or cephalopods with external shells, there are two existing types—the true or pearly nautilus, and the argonaut, or paper-nautilus. The shell of the pearly nautilus is common in museums; it is in the form of a spiral coil, and is divided into numerous chambers, in the outermost of which the animal resides, leaving the others empty. The examination of the few live specimens that have been caught shows that the animal differs in important respects from the sepiophorous cephalopods. It has four gills, and upwards of a hundred tentacula, which, however, are quite short, and unprovided with suckers; it seems to crawl on a fleshy disk on its head, and to live rather on molluscs than on fishes. By some means not very well ascertained, but connected with the peculiar structure of its shell, it has the power of rising or sinking in the water as it pleases. Beside the specimens of the shells of existing natuli are placed specimens of the fossil *ammonites*, or snake-stones, which in all probability were shells of cephalopods of the same kind, now extinct. If so, some of them must have been of gigantic size, as ammonites have been found measuring five feet in diameter. The argonaut, or paper-nautilus, so called from the beautiful delicacy of its shell—which resembles that of the pearly nautilus in shape, but consists of but one chamber throughout—is in a somewhat equivocal zoological position; various circumstances, such as the absence of any muscular attachment between the animal and the shell, seeming to indicate that the shell does not belong to the animal, but is only its usurped abode. The animal always found in these shells, however, is a peculiar eight-armed cephalopod; and if this animal is to be regarded as a parasite, the true zoological place of the shell itself remains yet to be determined. Mr Gray, inclining to the parasitic theory, has placed the fine specimens of argonaut shells belonging to the museum in Case XXIII, among the shells of the gasteropodous molluscs, where their beauty cannot fail to attract attention.

Regarding the argonauts a curious belief long prevailed —namely, that they moved along the surface of the sea as in a boat, using two of their arms, which have wing-like terminations, as sails to catch the wind, and the other six as oars. Hence the poetic fiction, that the sight of the paper-nautilus suggested to man the idea of a ship. The argonauts, it is now ascertained, however, do not elevate their winged arms, but fold them round the shell, moving backwards by the action of the others, like other cephalopods, and also crawling at the bottom.



Shell of Paper-Nautilus.

II.—The Collection of Birds.

The magnificent collection of birds contained in the wall-cases of this gallery is arranged in five divisions corresponding to the five great orders into which this class of vertebrata has been distributed by ornithologists—namely, *Raptores*, or birds of prey; *Insessores*, or perching-birds, so called because, though other birds perch also, birds of this class exhibit this habit more peculiarly; *Rasores*, or scraping-birds, called also gallinaceous birds; *Grallatores*, or wading-birds; and *Natatores*, or swimming-birds. It is calculated that there are now known upwards of 5000 species of birds of all these kinds; of which 490, according to a catalogue published in 1840, are European; distributed among the several orders thus:—*Raptores* 54 species, *Insessores* 209 species, *Rasores* 28 species, *Grallatores* 87 species, and *Natatores* 112 species. Of all these European species, and of a vast proportion of the others, if not of them all, there are specimens in the museum. There can be little difficulty in distinguishing the several orders. Raptorial birds bear the marks of their character in their strong hooked-bills, stout legs, and sharp, powerful talons; perching-birds in the mechanism of their legs, and especially of the foot, in which the hinder toe is on the same level with the front toes, thus giving a facility for grasping and climbing rather than for walking; scraping or gallinaceous birds in their short wings, ill adapted for flying, their bulky bodies, their strong legs, so well fitted for walking on dry ground, and their feet made for scraping; wading-birds in their long stilt-like legs, adapted in some for running, and in others for wading; and swimming-birds in their short legs placed far back in their bodies, and in their feet, which are generally webbed. In the different tribes and genera also into which the orders are divided, the same adaptation of the structure of the bird to its special habits is equally discernible. In the colours of many birds, for example, as in those of insects, there is a beautiful provision, each bird resembling in colour the ground or element in which it seeks its food, and thus more easily escaping the notice of its enemies.

Raptorial Birds—Cases I-XXXV.—These are subdivided into *diurnal birds of prey* and *nocturnal birds of prey.*

The diurnal birds of prey (Cases I-XXX) comprehend the two great families of the *vultures* and the *falcons*, both of which are amply represented in the cases under notice. Among the vultures (Cases I-VIII) are to be seen the condor, or great vulture of the Andes, an enormous bird, whose expanded wings sometimes measure eleven feet across, and which soars to immense heights, Humboldt having once seen a bird of this species 22,000 feet above the level of the sea; the bearded vulture of the Alps and Himalehs; the cinerous vulture from Northern Africa; and the fulvous vulture of Europe and Africa, which feeds on carrion, gorging itself sometimes for several days over a dead carcase. Carrion, indeed, is the characteristic food of all the vultures, which have not talons strong in proportion to their bodies, and being less courageous than other raptorial birds, rarely attack living animals. In many countries vultures are useful as scavengers, clearing away offal that would otherwise breed pestilences. They seem to trace their prey chiefly by the scent. Among the *falcons* (Cases VIII-XXX) may be observed—1. A fine collection of eagles (Cases VIII-XVII), including the golden eagle of the British islands, a kingly-looking bird of great strength and courage, which preys on hares, rabbits, lambs, and other such animals, and procures them in such quantities for its young, that poor families in the west of Ireland have been known to derive a constant supply of animal food during summer by keeping young eaglets about their premises, so placed that the parent birds could still visit them; the booted eagle of Egypt; the Brazilian eagle; the bald eagle, the representative of the United States of America, an honour which Franklin regretted had been conferred

Condor.

on it, the bird being, as he said, of 'bad moral character, and not getting his living honestly'—an allusion to his practice of robbing other birds, particularly the fishing-hawk, of what they have caught; the harpy eagle of South America, a bird of sinister aspect; the Pondicherry eagle from India, where it is worshipped by the Brahmins; and many others. 2. A collection of buzzards and kites (Cases XVIII-XXIII). 3. The true-falcons (Cases XXIV-XXVI), the most courageous in proportion to their size of all birds of prey; comprising six species, of which the most remarkable is the peregrine falcon, formerly used in the sport of hawking, the female, which was the larger and stronger, receiving, *par excellence*, the name of *falcon*, and being flown at large birds, such as herons, while the male, called the *tiercel* or *tassel*, was flown only at such smaller birds as partridges. These peregrine falcons were very expensive among our forefathers; the use of them was permitted only to persons of rank, and to injure one of their nests, even on one's own grounds, was a crime severely punishable. Their power of wing is almost incredible: a case is recorded of a falcon flying 1350 miles in twenty-four hours, or nearly sixty miles an hour. When flown at a heron or any other bird, their plan was to chase the bird, mount above it, and then swoop down upon it. To do this in the proper manner they required training; an untrained falcon was called a *haggard*. 4. The sparrow-hawks (Case XXVII). 5. The harriers (Cases XXVIII-XXX).

Of the nocturnal raptorial birds or owls (Cases XXXI-XXXV) there is a very ample collection, interesting to those who delight in curious varieties of physiognomy, as well as to ornithologists. Looking at some of these wise-looking birds, with their big round heads, docked bodies, and goggle eyes, one could almost believe the story of the Cockney sportsman, who, having shot something that he saw flying overhead as he and a companion were passing through a churchyard in the evening, cried out in horror as he picked it up fluttering from beside a tombstone, 'Oh, Jack, I have shot a cherub!' Owls feed on insects, field-mice, &c.; some of the larger species, such as the horned owl, are destructive even to hares and rabbits.

PERCHING-BIRDS — Cases XXXVI-LXXXIII. — This order, which is the most numerous of all, as might be expected, considering the vagueness of its designation, is subdivided into five sections:—*Fissirostres*, or wide-gaping (literally cleft-beaked) perchers, whose name indicates their peculiarity; the *Tenuirostres*, or slender-beaked perchers; the *Dentirostres*, or tooth-beaked perchers, which have bills toothed or notched, somewhat as in the birds of prey; the *Conirostres*, or cone-beaked perchers; and the *Scansores*, or climbers.

Fissirostres—Cases XXXVI-XLII.—Here may be seen specimens of the various families of birds adapted for catching their prey (chiefly insects) when on the wing—as the goat-suckers, nocturnal birds that derive their name from a mistaken notion that they suck the blood of cattle, whereas they are insect eaters, having large eyes, to enable them to discern their prey, and bills so wide, that they can gulp down the largest moths whole; the well-known swallows and swifts, which remain in this country only during half the year, migrating southwards on the approach of winter; the todies, rollers, broad-bills, &c.; and lastly, the kingfishers, which of all British birds have the most brilliant plumage, and which usually build their nests in the high banks of streams, over which they fly, catching insects, and sometimes diving for small fish. The classic name of this beautiful bird was *halcyon*, and the phrase 'halcyon days,' as applied to times of unusual prosperity, is said to have been derived from the notion, for which there was no foundation, that the bird hatched its eggs in a floating nest, and that during its incubation there was always a calm at sea. Among the kingfishers, besides those of Europe (Cases XLI, XLII), are some curious species from the East Indies, South America, Australia, &c.

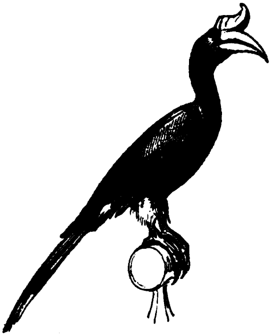
Tenuirostres—Cases XLIII-XLVII.—Of this group, distinguished by their long slender bills, and by the curious structure of their tongues, which are long, and usually divided into threads or filaments like a brush, it has been remarked that it is 'among the most interesting of the animal world. Deriving their subsistence for the most part from the nectar of flowers, we never fail to associate them in our ideas with that more beautiful and perfect part of the vegetable creation with which, in their delicacy and fragility of form, their variety and brilliancy of hues, not less than by their extracting their nourishment from vegetable juices, they appear to have so many relations.' They are for the most part natives of southern climates. Among those in the cases under notice may be enumerated the hoopoes and sun-birds, the males of which have beautiful plumage, and sing agreeably; they are most common in the warm regions of the eastern hemisphere; the honey-eaters of Australia, whose tongue is terminated by a bunch of delicate filaments admirably adapted for licking up the sugared sweets of the flower-cups; and the creepers, nut-hatchers, wrens, and other small birds that feed on insects, chiefly obtained by striking the bark of trees. But by far the most interesting of the tenuirostres are the exquisite little humming-birds of the American continent and the West Indies, near the case containing which (Case XLIV) the visitor cannot help lingering with admiration. Some of these little creatures, with their inimitable plumage of splendescent purple mingled with other bright colours, are really no bigger than queen-bees, and look as brisk and light as when they fluttered in the sunshine over the gardens of Brazil. The humming whence they derive their name is produced by the whirring of their wings. These birds usually remain near the tropics, but it is reported that humming-birds were once seen in Terra del Fuego hovering during a snow-shower over the blossoms of a fuschia!

Long-tailed Humming-bird.

Dentirostres — Cases XLVIII-LXI.—This group is the most allied to the birds of prey of any of the perching-birds. Their food consists generally of insects, worms, &c. and they only resort to fruits, grain, &c. when their favourite food fails. To this group belong the warblers (Cases XLVIII-LII), so called from their admirable powers of song; they are usually of small size, and of plain or even dusky appearance, and include such well-known birds as the nightingale, the redbreast, the willow-wren, the wagtails, &c. After them in the same group come the thrushes (Cases LIII-LV), arranged under various designations—as the ant-thrushes from the tropics, where they live on ants and other insects; the true thrushes, including the blackbird, the mavis, and the famous mocking-birds of America, which can mimic almost any sound they hear; and the babbling thrushes of the warmer parts of the world, which derive their name from the peculiar noise they make. The next groups are those of the fly-catchers, which catch their insect-prey flying (Cases LVI, LVII); the chatterers, the most characteristic specimens of which are American, and are remarkable for the beauty of their plumage (Cases LVII-LIX); and the shrikes, or butcher-birds, found in most parts of the world, and deriving their name from the manner in which they treat the insects, young frogs, &c. on which they feed, often impaling them on thorns, and tearing them to pieces at their leisure. One of the most curious of the shrikes is a species with a forked tail, an engraving of which is given on the following page.

Conirostres—Cases LXII-LXXIII.—Birds of this group are omnivorous, but feed chiefly on grain and fruit. They are divided into the following families:—The crows (Cases LXII, LXIII), including specimens of this common type from all parts of the world, allied to which in nature, though not in appearance, are the famous Birds of Paradise (Case LXIV), found only in New Guinea and the adjacent islands, the natives of which used to sell them to traders, having previously taken off their legs; hence the belief that they wanted those limbs altogether, and hovered continually on their beautiful wings; the starlings (Cases LXVI, LXVII), which are found in both hemispheres, are gregarious in their habits, and are often to be seen resting on cattle, the vermin on which they pick up and eat. The weavers of Africa and India (Case LXVIII), which form their nests of interwoven blades of grass; the brilliant-feathered tanagers of America (Cases LXVIII, LXIX), allied to the sparrow in their habits; the extensive family of the finches (Cases LXIX, LXX), including the goldfinch, the greenfinch, the chaffinch, the linnet, the house-sparrow, &c.; the larks with their allies from all countries (Case LXXI); and lastly, the hornbills (Cases LXXII, LXXIII), which are remarkable for the immense size of their bills, and the strange horny humps or excrescences that grow on the top of them. These excrescences, though heavy in appearance, are in reality extremely light, being quite cellular in their structure; they vary in size, form, &c. with the age and species of the bird; their exact use is not known. Hornbills go in flocks, like crows, and are very shy; their chief food consists of mice, reptiles, small birds, and fruit, which they throw up in the air, and catch when descending.

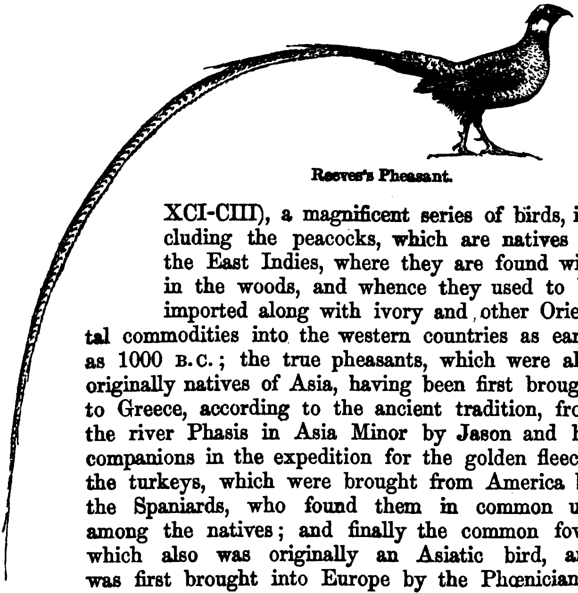
Forked-tail Shrike.



Rhinoceros Hornbill.

Scansores—Cases LXXIV-LXXXIII.—In this group are included all the species of parrots, mackaws, cockatoos, &c. which, with the crows, starlings, and some other birds, have the faculty of mimicking the articulations of the human voice (Cases LXXIV-LXXVI); the toucans, which resemble the hornbills in habits (Case LXXVII); the woodpeckers (Cases LXXVIII-LXXX), whose bills are formed for piercing the bark of trees, and their barbed tongues for transfixing the insects beneath; and the cuckoos (Cases LXXX-LXXXIII), well-known for their migratory habits, and for their practice of depositing their eggs in the nests of other birds, where the young cuckoos, as soon as they are hatched, act a tyrannical part, and throw out their young foster brothers and sisters.

SCRAPING OR GALLINACEOUS BIRDS—Cases LXXXIV-CVI. —The families of this order are—1. The pigeons (Cases LXXXIV-XC), of which there is a very fine collection; 2. The curasows, a peculiar kind of American poultry; 3. The pheasants (Cases XCI-CIII), a magnificent series of birds, including the peacocks, which are natives of the East Indies, where they are found wild in the woods, and whence they used to be imported along with ivory and other Oriental commodities into the western countries as early as 1000 B.C.; the true pheasants, which were also originally natives of Asia, having been first brought to Greece, according to the ancient tradition, from the river Phasis in Asia Minor by Jason and his companions in the expedition for the golden fleece; the turkeys, which were brought from America by the Spaniards, who found them in common use among the natives; and finally the common fowl, which also was originally an Asiatic bird, and was first brought into Europe by the Phœnicians; 4. The grouse and partridge tribe, including the grouse, the partridge, the ptarmigan, and other birds known to the sportsman. Of the whole order, perhaps the most interesting are the speci-



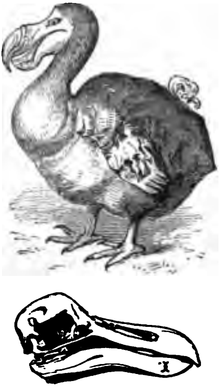
Reeves's Pheasant.

mens contained in Case XCV of Reeves's Chinese pheasant—a member of the pheasant tribe remarkable for the extraordinary length of its tail-feathers, and which no visitor to the museum can fail to admire. The first specimen of this noble bird, which is considered a rarity even at Pekin, its native district being one of the coldest and most mountainous provinces of China, was sent to Europe by Mr Reeves, and lived for some years in the garden at the Regent's Park London. Some of its tail feathers measured five feet six inches in length. Whether this splendid species of pheasant might be naturalised in this country does not appear; possibly it might, as the common cock and hen, and other birds of the pheasant tribe, have been before it.

WADING-BIRDS—Cases CVII-CXXXIV.—Included in this order, although not wading-birds in the strict sense of the word, living as they do on extensive arid plains far from the sea, are the ostriches, of which and their allies the emu, the cassowary, &c. there are fine specimens in Cases CVII-CIX. These birds have by recent zoologists been erected into a separate order called *Cursores*, or runners. They are remarkable for the resemblance of their feathers to hair, for their want of the power of flight, and for the great size and strength of their legs. In the ostrich the structure of the foot is also interesting, consisting as it does of only two toes, the inner twice as long as the outer—an arrangement highly favourable to swift running. On its native African or Arabian deserts the bird, which is often upwards of six feet high, will outstrip a horse. Ostriches live in herds, and leave their eggs, which weigh about three pounds each, to be hatched among the sand by the heat of the sun. Their food consists of grain and herbage, but they swallow stones, pieces of metal, &c. to assist in the trituration of what they have eaten; hence the exploded story of their digesting iron.

Ostrich.

The case adjacent to that containing the ostriches (CVIII) deserves very special notice. At the back of this case may be seen a very dingy picture, the subject of which can hardly be made out without the assistance of the guide-book, which informs

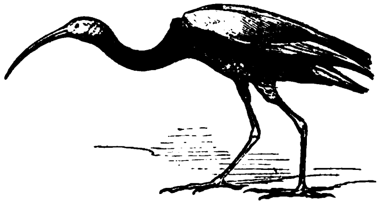


Dodo—Painting and Skull.

us that it represents an extinct bird called the *dodo*, and that of this bird there is a foot preserved in the same case, together with a cast of a head, the original of which is at Oxford. How precious this shrivelled foot, dingy picture, and insignificant-looking plaster cast are, will be understood from the following passage, in which also are succinctly given all the particulars that are known respecting the mysterious bird in question:—'With this group [the ostriches] is probably to be associated the dodo, now known to us only by some very imperfect remains, and by the paintings and descriptions of naturalists nearly two centuries since, when it seems to have existed on the islands on the eastern coast of Africa, especially Madagascar, though no traces of it can now be found there. A foot preserved in the British Museum, and a head in the Ashmolean Museum at Oxford, are all the actual remains of it now existing. It would appear, however, from the records of the Ashmolean Museum, that an entire specimen formerly existed in it, which was allowed to decay, and its remains to be lost, with the exception of this head. There is also a picture copied by Edwards, an eminent ornithological artist of the middle of last century, from a Dutch painting said to have been made from the living bird in the early times of the discovery of the Indies by the way of the Cape of Good Hope. [The painting in the museum is this reputed original Dutch painting; the copy alluded to was made by Edwards for his works.] From *this picture only* all the figures that have been made of the dodo (except those copied from still more imperfect delineations, of which a sufficient number exist to confirm the general correctness of this) are derived. The opinions of the most eminent naturalists concur in regarding the preserved head and foot as different from those of any existing bird, and as corresponding in character with those represented in the picture; but upon the place of this remarkable species in the class there is considerable difference of opinion. From the insufficiency of the wings for the purposes of flight, the dodo should probably take its station among the cursores; but in its general structure and economy, it seems, from traditionary accounts, to have been more allied to the rasores. Others, however, regard it as a bird of prey. ["The bird represented in the painting," says Mr Gray, "in the shortness of the wings and in the colour, has much analogy to the ostrich; but the preserved foot greatly resembles that of the common fowl, and the head is most nearly allied to the vulture's; so that if these remains really belong to one species, and that the one here represented, its true place in the series of birds is not as yet satisfactorily determined."] As to the cause of the entire disappearance of the species from the islands where it seems to have been once abundant, we can only conjecture. It is spoken of as an excellent article of food; and from its incapability of flight, joined to the shortness of its legs, it would fall an easy prey to its pursuers. Hence it was not improbably exterminated by the first settlers in the Mauritius and Bourbon—the islands where it seems chiefly to have abounded. Whether or not it yet exists in the adjacent parts of the African continent cannot be determined until those parts have been more thoroughly explored.' * Thus informed regarding the dodo, the visitor to the museum will doubtless look at these scanty and imperfect relics with extreme interest.

In the same case with the relics of the dodo are placed specimens of another curious bird that will probably soon be extinct—the *apterix*, or wingless bird of New Zealand. This is a nocturnal bird; and its structure is exceedingly interesting to the anatomist, as exhibiting in more respects than one an approach to that of the mammalia.

Among the wading-birds, more strictly so called, are the cranes (Cases CXV-CXVII), 'which are found in most parts of the world on the borders of rivers and inundated places, seeking for small fish and reptiles.' The herons, bitterns, &c. (Cases CXVIII-CXXIII), the storks (Cases CXXIV, CXXV), and the ibises, including the celebrated Egyptian ibis, which was held sacred on account of its serpent-devouring propensity, and was one of the animals usually embalmed after death.


Ibis.

SWIMMING-BIRDS—Cases CXXXV-CLXVI.—In these cases we have first the flamingoes, remarkable for their bright crimson colour, the length of their legs and necks, and for the curious bend in their mandibles, which obliges them to invert their heads when seizing the shell-fish, &c. on which they feed; then the various species of geese, swans, ducks, and allied oceanic birds (Cases CXXXVII-CLII); then the strange sea-parrot tribe, including the penguins (Case CLVI); then a collection of gulls, as the petrels, or 'Mother Carey's chickens,' including the albatross, made famous by Coleridge in his 'Ancient Mariner,' the true gulls, the terns, the skimmers, &c. Lastly (Cases CLXII-CLXVI), we have an assemblage of very interesting birds—the pelicans, the gannets, the frigate-birds, &c. Regarding the gannet, or Solan goose, the following is a passage from Mr Paterson's 'Zoology:'—'The gannet, when searching for food, flies a short way above the surface of the water, and on seeing a fish, rises into the air, and descends with such rapidity and force as to secure its prey. Some idea of the power of its descent may be formed from a circumstance related by Pennant. One of these birds, flying over Penzance, saw some pilchards spread out upon a fir plank about an inch and a-half thick, and darted down with such violence, that it struck its bill quite through the board, and broke its neck. Pennant adds that these birds are sometimes taken at sea by a similar deception, a fish being fastened for the purpose to a floating plank. But perhaps a juster estimate of the impetus of the descent may be formed from the depth to which it propels the bird in the water. At Ballintrae, on the west coast of Scotland, gannets are not unfrequently taken in nets sunk to the depth of from nine to twenty fathoms (54 to 120 feet), and sometimes to that of thirty fathoms (180 feet). On one occasion so many as 128 of these birds were thus captured at one time, and in their struggles brought the nets with their sinkers and fish to the surface.' More remarkable still in some respects is the bird with which the ornithological collection concludes—the frigate or man-of-war bird. This bird, which has a long light body, and wings measuring from nine to twelve feet when expanded, is found hovering over the Atlantic and Pacific oceans, a thousand miles or more from land, fishing busily, without ever resting on the water, and yet showing no sign of fatigue—'supported,' says the ornithologist Vigors, 'in its unlimited flights by the strength and expansion of its wings, and aided by the singular mechanism of its tail and the buoyant nature of the inflated sac which distends its throat, it seems to be an inhabitant of the air rather than of the land, where it resorts alone for the duties of its nest—or of the water, over which it only hovers for its prey.'

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* Treatise on Zoology. Chambers's Educational Course.

THE MAMMALIA SALOON—THE CENTRAL LOBBY—AND THE SOUTHERN ZOOLOGICAL GALLERY.

These three apartments, which are contiguous, and form, in fact, but one great irregular saloon, contain the only remaining portion of the zoological department—namely, the general collection of mammalia. As the forms and habits of these animals are, on the whole, better known than those of the inferior classes with which we have hitherto been occupied, a detailed description will here be the less necessary, and it may be sufficient to indicate generally the extent of the collection and its wealth or deficiency in particular orders. To the unscientific lover of animals, indeed, a visit to the living mammalia in the Zoological Gardens would in many respects be far more interesting and instructive than a walk amid these stuffed and shrivelled specimens, whose attractions are chiefly for the professional zoologist, anxious to complete his list of genera and species.

The class MAMMALIA, comprehending about 1500 known species of animals, of which only about 80 are British, is usually divided into eleven orders: the *Marsupiata*, or pouched animals—as the opossum and kangaroo; the *Rodentia*, or gnawing animals—as the rat, hare, and squirrel; the *Edentata*, or toothless animals—as the sloth; the *Ruminantia*, or ruminating animals—as the ox and deer; the *Pachydermata*, or thick-skinned animals—as the rhinoceros and the elephant; the *Cetacea*, or whale-tribe; the *Carnivora*, or rapacious flesh-eating animals—as the lion and tiger; the *Insectivora*, or insect-eating animals—as the hedgehog; the *Cheiroptera*, or bat tribe; the *Quadrumana*, or monkey tribe; and the *Bimana*, or human species.

Such, slightly modified, is the classification proposed and adopted by Cuvier: that followed by Mr Gray, however, as the basis of the arrangement in the museum, is different. Adopting the chief distinctions of Linnæus and Ray, Mr Gray classifies mammalia in five orders, as follows:—

I. PRIMATES, or highest order; comprehending the Bimana, Quadrumana, and Cheiroptera of the foregoing classification, and divided into five families:—1. *Hominidae*, or man-shaped tribe, including not only man, but those quadrumana that approach nearest to him in form; 2. *Sariguidae*, including most of the monkeys not included in the previous family; 3. *Lemuridae*, or lemur-tribe, which supply the place of monkeys in Madagascar, and some parts of India and Africa; 4. *Galeopithecidae*, or flying lemurs of the Indian Archipelago; 5. *Vespertilionidae*, or bat-tribe.

II. FERAE, or wild beasts; comprehending the Carnivora, Insectivora, and Marsupiata of the other classification, and divided into five families:—1. *Felidae*, or the cat-tribe; 2. *Ursidae*, or the bear-tribe; 3. *Talpidae*, or the mole-tribe; 4. *Didelphidae*, or the kangaroo-tribe; 5. *Phocidae*, or the seal-tribe.

III. CETE, or whale-like animals; answering to the Cetæcea of Cuvier, and divided into five families:—1. *Balaenidae*, or the whale-tribe; 2. *Delphinidae*, or the dolphin-tribe; 3. *Trichecidae*, or walruses; 4. *Manatidae*, or manatees; 5. *Halicoridae*, or dugongs.

IV. GLIRES, or dormouse-like animals; answering to the rodentia of Cuvier, and divided into five families:—1. *Muridae*, or the mouse-tribe; 2. *Hystricidae*, or porcupines; 3. *Leporidae*, or the hare-tribe; 4. *Jerboidae*, or the jerboa-tribe; 5. *Aspalacidae*, or the vole-tribe.

V. **UNGULATA**, or hoofed animals; comprehending the Ruminantia, Pachydermata, and Edentata of the other classification, and divided into five families:—1. *Bovidae*, or the ox-tribe; 2. *Equidae*, or the horse-tribe; 3. *Elephantidae*, or the elephant-tribe; 4. *Dasypidae*, or the armadillo-tribe; 5. *Bradypidae*, or the sloth-tribe.

It will be observed that the number *five* predominates in this classification; the entire class being divided into five orders, and each order into five families. The families themselves too, where they are divided at all, are divided into five sub-families. The principal object of this artificial uniformity is to exhibit the manner in which the orders seem to be connected together by a common principle of gradation running through them, so that every part of one order answers to a corresponding part in all the others.

Of the twenty-five families into which, according to this system, all mammalia are distributed, six—namely, the *Vespertilionidæ*, or bat-tribe among the primates, and all the five of the order GLIRES—have been already disposed of under the head of the Northern Zoological Gallery, where all the specimens relating to them are in the meantime deposited. Of all the remaining nineteen families, representatives are to be found in the apartments now under notice, distributed pretty nearly in the foregoing order of enumeration as follows:—

MAMMALIA SALOON.

I. PRIMATES.—Wall-Cases I-XX; thus subdivided:—

Hominidæ, or (Man being omitted for obvious reasons) *Old-World Monkeys*—Cases I-XI.—These monkeys, included by most zoologists under the general name of *Simiadæ*, or the ape-tribe, and popularly divided into the three categories of apes, monkeys, and baboons, are, after man, the most highly organized members of the animal kingdom. The circumstances that chiefly distinguish them from the other and lower families of monkeys yet to be mentioned are—the thinness of the partition between their nostrils; their having but *ten* molar teeth in each jaw; and their having one finger on each of their four hands opposable to the others, as the thumb is in man, thus giving a facility for grasping. Among themselves, too, there are subordinate

Proboscis Monkey.

distinctions: the apes, for example, having no tail, the monkeys having a long one, and the baboons a short one. Among the specimens of these various quadrumana are—the Chimpanzee from West Africa, in which the points of resemblance to man are most decided; the orang-outang, or pongo, of the Eastern Archipelago; the gibbons also, from Eastern Asia; a large collection of monkeys from different parts of Asia and Africa, of which the proboscis monkey from Borneo, so called from a peculiar prolongation of its snout, is perhaps the most curious; and finally, various specimens of baboons, Asiatic and African.

Sariguidæ, or New-World Monkeys, called also Cebidæ—Cases XII-XVIII.—The inferiority of these American monkeys to the monkeys of the old world appears in the breadth of the partition between their nostrils; in their having *twelve* molar teeth in each jaw; in their having a thumb or opposable finger only on their hinder-limbs; and in their having very long tails, used for prehensile purposes when they climb. Among the most remarkable specimens are the Howlers; monkeys of hideous appearance, that derive their name from the howling noises they make at night in the forests.

Howling Monkey.

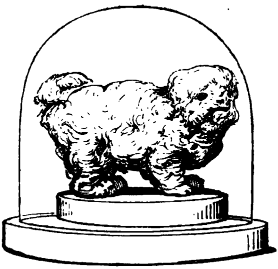
Lemuridæ, Lemurs, or Madagascar Monkeys—Cases XIX, XX.—The lemurs differ from American monkeys chiefly in having more prolonged muzzles. They live principally on fruits, are nocturnal in their habits, and of gentle disposition.

Galeopithecidæ, or Flying Lemurs, called also Colugos—Case XX.—These animals closely resemble bats, having their limbs connected by a loose skin, which serves as a parachute to assist them in their leaps, and of which also they make a kind of hammock for their young, suspending themselves back downwards from a branch.

II. Feræ, or wild beasts (about 239 known species)—Cases XXI-LII—subdivided thus:—

Felidæ, or Cat-tribe (Cases XXI-XXXVIII), divided into five sub-families.—1. Felina, or cats, including the lion, the tiger, the leopard, the lynx, &c. of all which there are specimens in Cases XXI-XXVII; one of the most remarkable being a black leopard or panther which earned its promotion to the museum by killing its keeper at a menagerie; 2. Hyænina, or hyenas (Case XXVIII); 3. Viverrina, or the various kinds of civets, genets, &c. (Cases XXIX-XXXI); 4. Canina, or the dogs (Cases XXXII-XXXVII), including foxes, wolves, &c. besides a variety of specimens of the common dog—of which there is one, a beautiful little creature of extremely minute size under a glass-case, and entitled 'Mexican Lapdog;' 5. Mustelina, or the various kinds of weasels, polecats, &c.

Ursidæ, or the Bear-tribe—Cases XXXIX-XLII.—Sub-families: 1. Gulonina, or the various kinds of gluttons (Case XXXIX); 2. Myadina, or the skunks (Case XXXIX); 3. Taxina, or the otters and badgers (Case XXXIX, XL); 4. Ursina, or the bears (Case XLI); 5. Procyonina, or the racoons (Case XLII).



Mexican Lapdog.

Talpidæ, or the Mole-tribe, comprehending moles, shrews, hedgehogs, and other small insectivorous quadrupeds.—Case XLIII.

Didelphidæ, or marsupial animals, comprehending kangaroos, phalangers, opossums, &c.—Cases XLIV-LII.—These animals, although arranged by Mr Gray as a family of the order *Feræ*, present so many peculiarities, that they are perhaps more justly to be considered as a distinct order, occupying the lowest place among mammalia, and bordering on the birds and reptiles. Their chief characteristic, and that which indicates this inferiority to other mammalia, is, that they bring forth their young in an undeveloped or rudimentary state, suckling them till they assume the complete form of their species, and carrying them in the meantime in a pouch formed by the skin of their belly. At first the mouth of this pouch is, as it were, glued up; but as the young ones grow, it opens, and they run out and in at pleasure. In some species, however, this pouch is wanting. The entire number of species in the family is estimated at about 120; and among these there are great differences of size, habits, and even structure. Some are not larger than a mouse or rat; others attain a height, when standing, of six or seven feet; some are carnivorous, some herbivorous, some insectivorous; in short, 'we find,' as has been remarked, 'among the marsupial animals analogous representations of most of the other orders of mammalia.' Nor is their geographical distribution less remarkable. 'At the present period,' says Mr Waterhouse, 'the great metropolis of the order is Australia; certain species of the group, however, are found in the Molucca Islands; and one genus containing many species (the opossums) is peculiar to the new world.' Of Australian marsupials of all kinds there are abundant specimens in Cases XLIV-LI; the smaller opossums of America are represented in Case LII.

Phocidæ, or Seal-tribe.—The various specimens of seals are arranged on the tops of the wall-cases round the saloon.

III. CETE, or whale-like animals.—The specimens of this order, including a few dolphins, porpoises, &c. are ranged, in the same manner as the seals, over the cases containing the carnivorous animals.

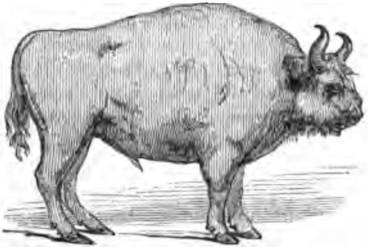
CENTRAL LOBBY AND SOUTHERN ZOOLOGICAL GALLERY.

These two apartments are devoted exclusively to specimens of the animals belonging to the important order UNGULATA.

CENTRAL LOBBY.—This room, which is the first that the visitor enters after ascending the great staircase, contains a portion of the specimens belonging to the first of the five families into which Mr Gray divides the ungulata—that is, the *Bovidæ.* In the wall-cases are arranged the specimens of antelopes, goats, and sheep; on the tops of the cases are horns of different kinds of oxen; and on the floor are two fine giraffes, the one from Northern, the other from Southern Africa. Among the specimens in the cases, perhaps the most interesting to visitors are the black bock, or sable antelope (Cases I-V), the licama, or harte-beast (Cases VI-VIII), the famous Cashmere goat (Cases VI-VIII), and the argali sheep from the Altai.

Head of Argali.

SOUTHERN ZOOLOGICAL GALLERY.—Here, besides a continuation of the *bovidæ,* in the form of specimens of oxen, deer, camels, &c. there are specimens of the four remaining families of UNGULATA—namely, the *Equidæ,* or horse-tribe, including the wild ass, the zebra, &c.; the *Elephantidæ,* or elephant-tribe, in its five sub-families of elephants, tapirs, rhinoceri, swine, and hippopotami; the *Dasypidæ,* or armadillo-tribe, including various singular animals; and the *Bradypidæ,* or sloth-tribe. Some of the larger specimens, such as the rhinoceri, two elephants (one a small specimen of the Indian elephant, the other a very young specimen of the longer-eared elephant of Africa), and a fine hippopotamus from South Africa, are arranged on the floor; the remaining specimens occupy the wall-cases. Among these the visitor will notice particularly the varieties of the llama of South America—the camels, as they have been called, of the new world (Cases I, II); the magnificent aurochs, or shaggy-maned Lithuanian bison, presented by the emperor of Russia, and said to be the finest specimen of stuffing in the museum (Cases III-XVI); the North American bison of the prairies (Cases III-XVI); the valke-vark, or emgallo (Cases III-XVI); and the deer and zebras (Cases XVII-XXX). If, however, the visitor wishes to see the greatest curiosity not only among the ungulata, but in the whole class of mammalia, let him single out, in the range of shelves above the bisons, the animal called *Ornithorhyncus*, or *Mullingong*. This animal, together with the *echidna*, or spiny ant-eater, constitute a sub-family of Mr Gray's dasypidæ; but so different are they from other animals, that some zoologists have erected these two species alone into a distinct order under the name of Monotremata. 'The ornithorhyncus (so called from its *bird*-like bill) is an animal of such extraordinary aspect, that the specimen first brought to this country at the end of the last century was supposed to have been *made up*, by the attachment of the beak and feet of a bird to the body of an otter-like quadruped. It was not until other specimens had arrived, and had been submitted to most careful examination, that naturalists were satisfied of the real existence of such an animal.' It is a native of Australia, where it is called the water-mole; its usual length is about eighteen inches, and it lives almost entirely in the water, swimming and diving like an otter, or grubbing for its food among the mud and rushes with its broad bill like a duck; and retiring, when alarmed, to its burrow, which runs far into the bank, and shelves upwards from the level of the stream. It is a timid animal, but is easily tamed.



Aurochs.

Ornithorhyncus.

GEOLOGICAL OR PALÆONTOLOGICAL SECTION.

The general doctrines of geology, as that science is now taught, may be summed up as follows:—That ages on ages ago the earth we now inhabit probably existed as a globular mass of fluid matter at a very high temperature; That by radiating off its heat into surrounding space, this mass has been gradually and slowly cooling ever since; That, first of all, by the refrigeration of its exterior parts, a solid uneven crust of some thickness was formed all round, within which the molten nucleus continued to boil and smoulder; That, as this rocky crust thickened sufficiently to confine the central heat, the watery parts of the mass that had till then probably hung about the solid parts in the form of diffused steam or vapour, became condensed, and sunk down into the hollows and cracks of the crust, forming seas, lakes, &c. while the prominences of the crust jutted up as dry land; That by the action of a variety of causes—such as that of wind, frost, the sun's heat, &c.—gradually loosening and disintegrating the surface of the dry land, of the currents of rivers abrading their channels, and of the continual surging of the sea wearing away coasts, the bottom of bays, &c. the exterior of the rocky crust was submitted to a process of alteration, the essential character of which consisted in the constant carrying away of matter from the higher, and the constant deposition of the same in the lower levels; That by the continuance of this process of abrasion and deposition during a long succession of ages, a succession of layers or strata of sediment was gradually built over the original rocky crust, the thickness of such layers being greatest at those spots where the deposition proceeded most rapidly, as at sea-bottoms, near the mouths of rivers, &c.; That probably for a long period after these mechanical and chemical influences were in operation on its refrigerated crust, the globe remained solitary, and uninhabited—a mere aggregation of mineral matter; but that at length, when the exterior refrigeration had reached a certain point, and the temperature of the sea and the land had become fit for vegetable and animal life, a grand creative change was effected, vegetation of certain kinds overspread the mineral crust, and various species of animals began to move on the lands and swarm in the seas; That these vegetables and animals co-operated with the mechanical and chemical agencies already at work in modifying the aspect and condition of the external crust—the coral animalcules, for example, building up reefs in shallow seas, and animal and vegetable remains generally becoming mingled with the detritus washed down by streams, and thus bedded in the sedimentary layers at their mouths; That, as time wore on, and the condition of the earth's crust, both as regards temperature and structure, changed, new races of vegetables and animals appeared, supplanting the old ones; and that at length, at a comparatively recent epoch, when the earth had been duly prepared, that final act of creation took place which ushered into existence the present vegetable and animal system, including man; That, accordingly now, we, the rational inhabitants of this elaborately-fashioned globe, are able, on examining it, to detect the records of all those strange revolutions of which it has been the scene—finding, for example, as we dig downwards into the crust of the earth, that it consists of strata or layers following each other in a certain invariable order, and containing most of them certain kinds of animal and vegetable remains which distinguish them from the others; But that, finally, owing to the ceaseless agency, during all these revolutions, of the great central fire that has been ever burning within the crust, heaving it, cracking it, and belching out volcanic and metallic matter through the cracks, at first incessantly, and latterly only sparingly, this stratification of the crust does not present the exact and regular appearance that it would have otherwise done—the strata not being found, like so many continuous coatings, nearly horizontal and parallel to each other, but in all positions, and in all directions, sometimes horizontal, sometimes inclined, sometimes curved, sometimes tilted up upon their edges, and sometimes interrupted by masses or veins of extraneous matter that have been ejected from the interior in a liquid state, and suddenly cooled.

The crust of the earth, it will be seen from this sketch, consists of three distinguishable portions—the original unstratified shell of rock which lies next to the molten interior, and which was formed by the refrigeration of the heated mass whose surface it once was; the strata of sedimentary matter, since superimposed upon that original shell; and the disrupting masses which at various epochs have burst through from the interior to the surface in a form analogous to that of lava. The first and the third being composed of similar materials, and formed by the same agency—namely, by the sudden cooling or crystallisation of an igneous mass—are designated by geologists by the term IGNEOUS or UNSTRATIFIED ROCKS; and their appearance easily distinguishes them from rocks of the second class, which are called AQUEOUS, SEDIMENTARY, or STRATIFIED ROCKS, to denote the fact, that they were slowly formed by the deposition or subsidence of matter at the bottom of seas, sheets of water, &c. Our investigations, measuring from the tops of the highest mountains to the bottoms of the lowest mines, do not penetrate the earth's crust to a greater depth than from five to six miles, yet they make us acquainted with the whole series of stratified rocks, as well as with the general nature of those that are unstratified. Digging, for example, at one spot, we come immediately upon granite, basalt, or some other unstratified rock; and there we know we are in contact with an upheaved ridge of the interior skeleton or shell that envelops the central fire; digging at another, we have to pierce through many successive layers of different material—chalk, sandstone, coal, &c.—before we reach this interior skeleton. The stratified rocks may, in fact, be compared to flesh covering an uneven spherical skeleton of bone; at one point the bone protrudes, so as to lie, as it were, close under the skin; at another successive layers of flesh must be cut through ere the bone is reached. The entire thickness of the crust of the earth, bone and flesh together, cannot be very great; for at the depth of twenty miles it is calculated the heat must be so intense, that the hardest granite would exist there only in a fused state. But as the diameter of the earth measures nearly 8000 miles, a solid crust of the depth of even thirty miles throughout would be but a mere film compared with the enormous interior mass that would be left; yet this film is sufficient to prevent the internal heat from passing through, except with extreme slowness; and also to resist its heaving action, except at certain points where, in the form of volcanoes, there exists a vent of communication between the interior and the atmosphere.

A vast interior ocean of mineral matter in a state of fusion; this ocean arched all round by an uneven skeleton or casework of solid crystallised or fireproof rock; and finally, over this skeleton a softer covering of stratified material, quite thin where the skeleton ridges upward, but in other parts of considerable depth, and stored with animal and vegetable remains—such is the globe on whose surface we now walk. Let us consider the three portions one by one:—

I. THE INTERIOR CAVITY.—The mean density of the whole globe being five times greater than that of water, while that of the exterior crust is little more than twice that of water, it follows that the mineral matter in the interior is of a very dense nature. The probability is, that the interior cavity is filled with a vast molten amalgam of the various metals and metalloids which chemistry recognises in hundredfold combinations in the outer crust. The extent of this interior molten mass must be continually decreasing by the radiation of the heat outwards through the solid crust; but as the conducting powers of the crust are extremely weak, the rate of such decrease must be imperceptibly slow, and must be continually becoming slower. Yet in the long lapse of ages the effects of such a cooling process must inevitably become visible in the diminished violence and extent of volcanic agency over the globe, occasioned by the thickening from within of the fireproof crust.

II. THE SKELETON OR UNSTRATIFIED PORTION OF THE CRUST.—This portion of the crust, formed, as it is, by the refrigeration or crystallisation of what was once part of the hot interior mass, must consist essentially of the same materials—that is, of the metals, metalloids, and gases, united, however, in certain particular combinations that they were obliged to assume by the circumstances attending their refrigeration. The most prevalent of those combinations, and that which constitutes the chief portion of the skeleton of the earth's crust, appears to be what is called *granite*. Wherever we penetrate beneath all stratified rocks, there we find granite, and wherever we find an igneous or unstratified mass bursting up through stratified rocks, and filling their rents and fissures, the material of which it is composed is sure to bear an analogy to granite. Under the general name of *granite*, in fact, are comprehended various species of rock. Granite proper, for example, consists of aggregated crystals of felspar, quartz, and mica, added to which there is in red granite an admixture of oxide of iron; in syenite or syenitic granite hornblende takes the place of mica; in protogine or protogenic granite talc is the substitute for mica; in serpentine there is a mottling of different colouring materials; in porphyry there are large independent crystals of felspar; and so on. But in whichsoever of all these varieties granitic rock is found, and of whatever fineness or coarseness of texture, it always presents an essentially crystalline and unstratified appearance, testifying that it was produced by the sudden cooling of a hot liquefied mass of mineral materials. Of such granitic materials, therefore, mingled with metallic veins, the entire skeleton of the earth's crust may be said to consist. Almost all the great mountain-ridges of the world—as the Alps, the Andes, the Pyrenees, and, in our own country, the Grampians and the Cumberland Hills—consist of granitic rocks, and are, in fact, but the high projecting bones of the general skeleton that encases the whole interior cavity, and for which in other districts we have to dig through superincumbent strata. But wherever we find such granitic or unstratified rocks, whether standing up in those great superficial ridges of bleak mountain scenery, or hidden down in more fertile districts beneath a series of stratified rocks of different texture, in no case do we find in them the slightest vestige of animal or vegetable remains. The reason of this might indeed be, as Mr Lyell and other geologists suppose, that as granite is of igneous origin, any organic remains that may have existed in the materials out of which it was made must necessarily have been destroyed during the process of the fusion to which these materials were subjected ere they became granite. It is quite possible, they say, that a manufacture of granite out of the lower sedimentary rocks may be perpetually going on in the bowels of the earth, and that thus the fossils of the earliest creations may be incessantly removed beyond our reach, just as a frog or a branch of a tree, if thrown into a brazier's pot, could not be traced in the melted metal that would be poured from it. The more probable supposition, however, is, that at the time that the great granitic skeleton of the earth's crust was formed by refrigeration, its exterior was not fitted for animal or vegetable existence at all, but presented the appearance of a blistered stony shell, full of smoking vents. The present granite rocks, therefore, may be assumed to be of an antiquity prior to any species of organized beings that has ever existed on the earth.

III. THE STRATIFIED ROCKS.—All these rocks, it has already been stated, have been gradually formed at the bottom of seas and lakes by the deposition there of the débris of the land carried down by rivers, streams, or the tide itself. But as such débris must always consist of matter abraded from previously-existing rocks, it follows that if we have a complete list of all the stratified rocks in their proper order, a certain relation will be found in their composition, each stratum being in general composed of the pulverised matter of that underlying it in the geological scale. Thus the first of all the stratified rocks, or, in other words, that which is always found underlying all the others, could consist of nothing else than the débris of granite, there being no other material then in existence out of which it could be formed. Washing along the bare granitic cliffs and sea-channels of the primitive globe, the surging waters would inevitably, in the course of ages, loosen their solid substance, detaching their various ingredients (felspar, quartz, mica, talc, hornblende, metallic oxides, &c.) from each other, carrying them away in currents, and depositing them in new combinations according to circumstances. In some places, for example, would be formed beds of the rock called *gneiss* by mineralogists, in which all the ingredients of ordinary granite (felspar, quartz, and mica) are present, still retaining their crystalline appearance, but rearranged in a manner showing that they have been at one time suspended in water. This rock, the lowest of all the stratified series, sometimes resembles granite so closely, as to be confounded with it; and it is not impossible that something of the semi-crystalline structure may be owing to a metamorphosing influence exerted upon it after its deposition by the heat of the interior masses over which it lay. Originally, however, it was a purely sedimentary rock; and in almost all places where it occurs—as, for example, in the Highlands of Scotland, where there are vast districts composed of gneiss rock—its stratification may be clearly traced. Another rock formed in the same manner as gneiss, and often found beside it, is that called *mica schist* or *mica slate*, which consists chiefly of the two granitic ingredients mica and quartz disintegrated apart from the third, recombined in a peculiar manner, and sometimes exhibiting large masses of quartz by itself intermingled with the proper rock. This system is found constituting the surface-rock over many extensive tracts of country; it may be said, indeed, of it and the gneiss system, its predecessor, that after the granitic rocks themselves they occupy the largest portion of the earth's crust, and approach most nearly to the character of universal rocks. Above these in the geological series, but still recognisable as composed of certain disintegrated granitic materials, are the two systems of argillaceous, or clayey rocks—namely, the SKIDDAW SYSTEM (so called because it prevails in the neighbourhood of Skiddaw in Wales), comprehending *hornblende slate* and *chiastolite slate*, both of which are finely-laminated slates of soft texture and dark colour; and the CAMBRIAN SYSTEM (so called from its prevalence in Wales generally), comprehending the common dark *clay-slate* used for roofing, &c.; together with the *Snowdon*, the *Plynlymmon*, and other Welsh rocks in which calcareous and sandy matter begins to intermingle with the clay, and render the slate coarse. All these argillaceous rocks must have been derived by aqueous agency from the clayey constituents of the granitic bases, probably through the medium of wasted gneiss and mica schist.

All the various strata that have been named—the gneiss, the mica schist, the hornblende and chiastolite slates of the Skiddaw, and the various clay-slates of the Cambrian system—constitute together what geologists call the INFERIOR or PRIMARY STRATIFIED ROCKS of the globe. When we take into account the immense thickness and extent of these strata, constituting as they do, next to the granitic rocks, the largest portion of the earth's crust, and when we remember that they were originally formed by the deposition by means of water, at the spots where they are now found, of muddy matter derived from granite by abrasion and disintegration, we obtain an idea of the enormous lapse of time that must have been required for their formation. During this long tract of time the conditions of the globe had become materially altered. Not only had the temperature of the exterior crust been gradually lowered by the contraction, so to speak, of the central fire, and the thickening of the crust, but by the incessant volcanic action of the central fire heaving, cracking, and disrupting the crust, the relative positions and proportions of sea and land had been changed; so that at last, instead of mere granitic ridges and peaks of porphyry rising bleak amid wildernesses of ocean, there were to be seen on the surface beds of gneiss, mica schist, and slate, that had once lain horizontally at the sea-bottom, but had been subsequently tilted up by the action of the central fire, together with the granite masses on which they had rested. By such changes it would appear the earth had at length been rendered a fit residence for certain kinds of organized beings; for in the upper strata of the Cambrian system, as in the Snowdon and Plynlymmon rocks, a few organic remains have been discovered, chiefly of the lower kinds of radiata. From the fact also that in this system there occur beds of the fine saccharine or crystallised limestone used for statuary marble (which limestone, composed as it is of carbonic acid and lime, must probably have derived its carbon from animal sources in the same manner as the later limestones), it is inferred that ere the close of the system the seas of the globe may have swarmed with polypes of the coral kind; whose remains at first existing in beds or reefs, were subsequently so acted on by the subjacent heat, as to lose the traces of their animal origin, and assume their crystallised appearance.

Quitting the primary rocks, and still ascending in the scale, we come upon a series of strata called by the older geologists the TRANSITION SERIES, from the idea that they exhibit the transition of the globe from its primitive to a more modern state. The lowest strata of this series are the *Grauwacke rocks*, so called from two German words signifying 'gray rock,' and among which some geologists reckon the upper strata of the Cambrian system: the upper strata are the *Silurian rocks*, so termed because they prevail in the district between England and Wales, anciently inhabited by a tribe of Britons called the Silures. The grauwacke rocks, still retaining much of the argillaceous substance of the clay-slates, &c. out of which they were formed, are, upon the whole, coarser, and contain more admixture of sand and limestone; while in the Silurian rocks we have masses of gray, blue, or dark limestone, intermingled with coarse mottled sandstones, and shales or laminated argillaceous deposits. During the period occupied in the deposition of these rocks the conditions of the globe must have been still farther changed. The interior heat having less power—owing to the thickness of the intervening crust—of operating on these deposits, they do not present the phenomena of crystallisation, cleavage, &c. visible in the primary rocks, and have altogether the aspect of strata formed amid a lower general temperature at the bottom of the sea, and subsequently upheaved by the action of the subjacent fire. While they were being deposited, the seas must have teemed with marine animals, whose remains, indeed, must have contributed largely towards their formation. Ascending from the lowest strata of the grauwacke up to the highest of the Silurian, we find—1*st*, Radiata of all kinds, including coral polypes, and immense numbers of the beautiful crinoid radiaria called stone-lilies; 2*d*, Marine molluscs, huge beds entirely composed of shells being found in both systems, and in the Silurian, many of the higher molluscous organisms, such as brachiopods and cephalopods, intermixed with the more ordinary gastropods and conchifers; 3*d*, Articulata, represented by such specimens as the peculiar extinct crustacean animal called the trilobite; and 4*th*, Vertebrata, represented by remains of a few rare fishes. The vegetable remains found in the same strata are comparatively less numerous, being confined to *algæ*, or sea-weeds, of various descriptions, and a very few of the lower kinds of land plants—such as filices, or ferns, equisetaceæ, or horse-tails, and lycopodiaceæ, or plants resembling club-mosses. From the fact that only marine animals have been found in rocks of the transition series, and that the plants found in it are either marine also, or such as grow only in ponds and marshes, we may imagine the general aspect of the earth's surface at the epoch of its history marked out by this series. With the exception of such bleak granitic ridges, porphyritic peaks, and gneiss slopes, as may here and there have stood up, the whole surface must have consisted of great ocean tracts, containing sea-weeds, and swarming with zoophytes and shell-fish, with alternating marshy spots, where, amid ooze and slime of all kinds, a few land plants could find root.

The next great geological era was that of the formation of the SECONDARY FOSSILIFEROUS STRATA, including the following important systems, arranged in ascending order in the scale: —the *Devonian*, or *old red sandstone system*, sometimes 10,000 feet thick, and consisting of deposits of red and yellow or gray sandstones, with beds of marl, shale, limestone, and conglomerate or puddingstone; the *Carboniferous*, or *coal-bearing system*, also of great thickness, and containing sandstones, limestones, and shales, with great beds of coal; the *Permian*, or *magnesian rocks*, consisting of sandstone, marl, gypsum, conglomerates, and the magnesian limestone called dolomite; the *Triassite*, or *new red sandstone system*, consisting of red marls, rock-salt, and sandstones; the *Jurassic*, or *oolite system*, consisting of sands, sandstones, limestones, and clays; and the *Cretaceous*, or *chalk system*, consisting of clay, green sand, iron sand, blue limestone, and chalk. These various systems, which are farther subdivided by geologists for the sake of convenience, abound in organic remains; and a comparison of the fossils found in the lower with those found in the upper strata, shows that during the immense period over which their formation extended, the conditions of the earth's surface must have been gradually modified; and that, corresponding with the progress of this gradual modification, new races of plants and animals must have appeared, while old ones, no longer finding the conditions suitable for their existence, died out to make room for them. In the Devonian, or old red sandstone rocks, are found, besides animal remains of the lower systems, gigantic fossil fishes, some with bony shields, some with wing-like appendages: a few land vegetables are also discovered in this system. In the carboniferous system, besides the zoophytes, shell-fish, crustacea, and fishes of the older strata, there have been discovered upwards of 300 fossil plants, all of kinds now extinct, including ferns fifty feet high, gigantic equisetaceæ, and huge pines and palm-trees—all of them the relics of a luxuriant vegetation that must have overgrown the dry lands of the upheaved old red sandstone, and been subsequently submerged or carried down with the detritus of rivers, and so bedded in the new strata, either in the form of single fossil trunks, &c. or as great coal-beds. In the next system —the permian, or magnesian rocks—reptiles of the Saurian or lizard order make their appearance; and these, with the addition of frogs, are continued through the new red sandstone. In the oolitic strata, besides gigantic lizards and crocodiles, both herbivorous and carnivorous, and some of them of very peculiar structure, we also find tortoises and the first remains of marsupial animals. Lastly, in the chalk system, besides sea-weeds, ferns, pines, cycadeæ, sponges, corals, shell-fish, crustacea, fishes, saurians, and tortoises, we find examples of the bird creation in a few specimens of waders. All these indications in the later secondary strata—the reptiles, the water-plants, the wading-birds, &c.—suggest the aspect of the surface of the globe at the close of the secondary period—seas, as before, full of zoophytes, sea-weeds, fishes, &c.; great granitic ridges and peaks rising up in bleak sterility, with large tracts of attached or detached marshy lands clothed with rank vegetation, and reeking with vapours, amid which crocodiles, lizards, and tortoises sought their prey; while here and there a marsupial animal squatted among the grass, or a solitary wading-bird stood amid the reeds and rushes.

In the TERTIARY STRATA, which name is given to all the strata above the rocks of the cretaceous group, we approach nearer to the present system of things; and in passing into these strata out of the secondary, we seem to overleap a great chasm in the history of the globe. While the secondary rocks stretch in continuous masses over extensive areas, and present a certain sameness in their composition all over the globe, indicating that they were deposited in wide tracts of sea, and formed throughout by great general agencies, the tertiary rocks occur in small isolated areas, patched, as it were, into the secondary; each patch, too, differing in composition, structure, &c. from the others—indicating, on the whole, that they were deposited in lakes, narrow estuaries, and local hollows in the already-formed continents of dry land, the matter used in their formation varying with the locality. Marls, clays, sands, limestones, and deposits of shells, constitute the usual substance of tertiary strata. The fossils found in these strata are also very different from those found in the secondary. Vertebrate animals of all kinds, including numerous mammalia, especially of the pachydermatous and edentate orders, abounded during the tertiary periods; and of the inferior classes of animals—such as corals, crustacea, and shell-fish—that had existed before the forms were altered to a closer resemblance with existing species. During the tertiary period also there is evidence that the earth underwent great variations of temperature—passing from a tropical to an arctic one, and again back into one of temperate heat—these variations being owing to relative elevations and depressions of the land and sea, effected by the ceaseless activity of the central fire. At last, towards the close of the tertiary period, the general outlines of the land-and-water areas of the globe seem to have become fixed as at present, so that, with some allowance for the effects of subsequent volcanic action, &c. a map of the globe as it was then would be the same as a map taken now, exhibiting the same forms of continents, the same chains of mountains, &c. Then it was that the final act of creation took place, and the present system of animated nature, with man at its head, was placed on the planet that had been so elaborately prepared for its reception. All the subsequent changes which have been effected on the face of the planet—the deposition, for example, above the tertiary strata of clay, gravel, sand, and boulders, by the action of water; the formation of soil by the decomposition of vegetable and animal substances with mineral admixtures; and the occasional depression or elevation of portions of the land or sea by volcanoes or earthquakes — come within the scope of human observation; and while they assist in enabling us to understand the past revolutions of our globe, indicate at the same time that even yet its ultimate state has not been attained.

Such is a brief sketch of the history of the formation of the globe we inhabit. Wherever we dig beneath its surface, we come upon the records upon which this sketch has been founded. At one place we come at once upon the unstratified granite; at another we find gneiss or some other primary stratified or metamorphic rock uppermost; at another we have the grauwacke or silurian; at another some of the secondary rocks; while, lastly, at some places we find ourselves on one of the tertiary basins, where, before reaching the granitic skeleton, we should have to cut down through many tertiary, secondary, and primary layers in succession. But while every locality thus supplies geological records of some kind or other, it is only the stratified districts that supply organic remains; and even with regard to these, different districts are of course more or less prolific, according to the geological eras they represent. Hence geological science is especially a work of co-operation. Organic remains collected by hundreds of different persons in hundreds of different localities must be brought together, in order that the student may have before his eye the complete verification of the science as it now exists; and not until there shall have been collected a perfect suite of all the fossils in all the strata of the earth's crust, from those of the later primary up to those of the latest tertiary, will there be materials for a complete history of the earth.

Two methods of arrangement may be pursued with regard to the organic remains collected in a museum:—1*st*, The different strata may be arranged in their proper geological order, beginning with the gneiss, mica schist, and clay-slate, and ending with the latest tertiary and the superincumbent alluvium; and a separate compartment may be assigned to the fossils (actual or expected) of each stratum; so that in traversing the whole range, one would pass in review the entire succession of animals and vegetables that have figured on the globe, from the first polypes and sea-weeds that existed millions of years ago, up to the Fauna and Flora of the contemporaneous earth: or, 2*dly*, The arrangement may be based on a special classification of the remains themselves on purely zoological and botanical principles—the fact of their being found in such and such a geological formation being added only as a subordinate circumstance. The former of these methods, aiming as it does at a general consecutive history of the earth, is evidently more philosophical and comprehensive than the second; but as a provisional method, the other has its advantages. Accordingly, this is the method adopted in the Museum.

The collection, which occupies the same gallery with that of minerals, consists of two portions:—1*st*. Vegetable remains, occupying the wall-cases of Room I of the gallery; and, 2*d*. Animal remains, occupying the wall-cases of Rooms II, III, and IV, together with the whole of Rooms V and VI.

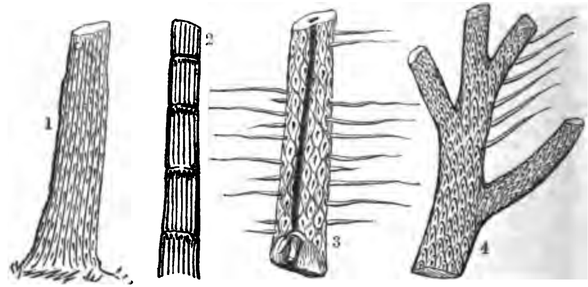
VEGETABLE REMAINS.

These are arranged as nearly as possible in a systematic botanical order, beginning with the cryptogamous plants, and ending with the dicotyledonous or higher class of phanerogams. On the whole, too, this agrees with the true geological order; for while the cryptogams abound in very early formations, and are speedily followed by the endogenous or monocotyledonous phanerogams, the most elaborately-organized dicotyledons do not make their appearance except in the later strata.

As the first types of animal life that appeared on the partially-refrigerated planet were marine, so the first vegetables of whose existence we have any traces were of the order *Algæ*, or sea-weeds. Such submarine plants must have formed the food of many of the zoophytes and molluscs, whose remains are found in the Cambrian, the grauwacke, and silurian rocks; and as the marine animals of the later formations must have also required such food, we find that a constant supply of the same marine vegetation was kept up during the secondary and tertiary periods. Beautiful specimens of fossil algæ, both of the earlier and the more recent formations, are to be seen in Case I. We annex a figure of the graceful and delicate *Fucoides Arcuatus.*

Fucoides Arcuatus.

This fact of the gradual diminution of the earth's temperature during the geological ages, is also corroborated by what is observed with regard to the remains of terrestrial vegetables. Of these the first that would make their appearance would be such plants as the *equisetaceæ*, or horse-tails (Case II), the *filices*, or ferns (Cases II, III), and the *lycopodeaceæ*, or club-mosses (Cases III-V), all of which, delighting as they do in marshy situations, would find a congenial soil in the swampy lands which began to emerge from the sea towards the close of the transition period. With regard to existing vegetables of these tribes, it is a general law that they are both largest in size and most abundant in tropical countries, especially in islands, diminishing both in size and number as they approach the poles. If, therefore, we find that fossils of these plants are largest and most numerous in the earlier formations, decreasing both in size and number in the later, the conclusion is obvious, that the primitive earth presented in a higher degree than the more recent the two conditions of warmth and moisture which favour the growth of such plants. And this is actually the case. Thus, of M. Brogniart's two genera of fossil *equisetaceæ*, or horse-tails—the equisetæ proper — and the more gigantic calamites, characterised by simple cylindrical stems, articulated at intervals, and generally without sheaths — the latter are found almost exclusively in the most ancient coal-formations, occurring sparingly in the superior strata of the secondary series, and not at all in the strata of the tertiary, or on the present surface of the earth. So also with regard to the *filices*, or ferns. While it has been calculated that the proportion of existing ferns to existing phanerogamous plants all over the globe is about 1 to 30, there are localities—such as Jamaica, New Zealand, Tahiti, and St Helena—where, owing to extremely favourable conditions of heat and moisture, the proportion rises as high as 1 to 10, 6, 4, or even 2; while in others, as in Northern Europe, owing to circumstances of an opposite nature, it falls as low as 1 to 70 or 80. Now it has been ascertained that in the great coal-formation the fossil ferns form nearly one-half of the whole contemporaneous Flora, while in the secondary strata generally they do not amount to one-third, and in the tertiary they fall almost to their present proportion—thus indicating that a gradual cooling and drying of the whole land area of the globe was going on during the geological epoch. In point of size, too, the more ancient fossil ferns correspond most nearly with existing tropical species—fossils of arborescent ferns fifty feet high having been found in ancient formations even beyond the tropics, and in spots where the existing ferns are diminutive. Lastly, in the case of the fossil *lycopodiaceæ*, or club-mosses, the same law of diminished size and number as we descend in the geological scale is found still to hold. While no species of existing club-mosses exceeds three feet in height, there are among the earliest fossils of this order specimens as large as forest-trees. Of these the greater number belong to an extinct family called the *lepidodendron*, which in its structure is supposed to be intermediate between the true lycopodiaceæ and the coniferæ.



1. Sigillaria pachyderma ; 2. Calamites cannæformis ; 3. Stigmaria ficoides ; 4. Lepidodendron Sternbergii.

Contemporary with the gigantic equisetaceæ, ferns, and lycopodiaceæ of the earlier secondary formations, were various genera of plants, of which we have no existing analogues, and which we are obliged, therefore, to class apart. Such are the various specimens of *sigillaria* and *stigmaria* deposited in the upper divisions of Cases V and VI. The sigillaria was a tree or plant with a round conical stem, deeply furrowed, but not jointed; it appears not to have been woody throughout, but to have contained, when living, a soft pulpy pith like that of the cacteæ. The fossil remains of this extinct plant consist exclusively of trunks of from one foot to three feet in diameter, which are found frequently in an erect position, but often prostrate in the sandstones and shales of the carboniferous system; the trees, when living, must have been often eighty feet high. Brogniart supposes the sigillariæ to have been a kind of arborescent ferns; but Lindley and others distinguish them entirely from ferns, and place them among dicotyledonous plants. Of the stigmaria, the following is the description given by Dr Buckland:—'The centre of the plant presents a dome-shaped trunk or stem, three or four feet in diameter, the substance of which was probably yielding and fleshy; both its surfaces were slightly corrugated, and covered with indistinct circular spots. From the margin of this dome there proceed many horizontal branches, varying in number in different individuals from nine to fifteen; some of these branches become forked at unequal distances from the dome. The extent of these branches, when outstretched and perfect, was probably from twenty to thirty feet. The surface of each branch is covered with spirally-disposed tubercles, from each tubercle there proceeded a cylindrical and probably succulent leaf; these extended to the length of several feet from all sides of the branches. The dome-shaped centres, and the length and forms of the leaves and branches, render it highly probable that the stigmariæ were aquatic plants trailing in swamps, or floating in still and shallow lakes, like the modern stratioles and isoetes. From such situations they may have been drifted by the same inundations that transported the ferns and other land vegetables, with which they are associated in the coal-formation. The stigmaria was probably dicotyledonous, and its internal structure seems to have borne some analogies to that of the euphorbiaceæ' (spurge worts).

Besides the above-mentioned cryptogamous plants, and unclassed plants apparently partaking both of the cryptogamous and the dicotyledonous in their structure, there are in the same cases specimens of fossil monocotyledons, such as the *palmæ*, and of fossil dicotyledons belonging to the orders *coniferæ*, *cycadeæ*, &c.; and on the lower shelves of Cases III, IV, and V, is a fine series of specimens of fossil wood polished, exhibiting the fibrous structure of the trunks and branches of this ancient Flora. It may be remarked here, that all the hardwood trees of the dicotyledonous order occur in strata more recent than the chalk or latest secondary, while the prior woods are exclusively coniferæ.

The following is Dr Buckland's general summary of facts relating to fossil vegetable remains:—'The most characteristic distinctions between the vegetable remains of the three great geological periods are—in the first [the transition, in which Dr Buckland includes the older secondary strata of other geologists], the predominance of vascular cryptogamic and comparative rarity of dicotyledonous plants; in the second, the approximation to equality of vascular cryptogamic and dicotyledonous plants; in the third, the predominance of dicotyledonous and rarity of vascular cryptogamic plants. The remains of monocotyledonous plants occur, though sparingly, in each period. The number of fossil plants yet described (in 1847) is about 500; nearly 300 of these are from strata of the transition series, and almost entirely from the coal-formation; about 100 are from strata of the secondary series, and more than a hundred from formations of the secondary series. The plants of the first period are in a great measure composed of ferns and gigantic equisetaceæ; and of families of intermediate character, between existing forms of lycopodiaceæ and coniferæ—for example, lepidodendriæ, sigillariæ, and stigmariæ, with a few coniferæ. Of plants of the second period about one-third are ferns, and the greatest part of the remainder are cycadeæ and coniferæ, with a few liliaceæ. More species of cycadeæ occur among the fossils of this period than are found living on the present surface of the earth. The vegetation of the third period approximated closely to that of the existing surface of the globe. Among living families of plants, sea-weeds, ferns, lycopodiaceæ, equisetaceæ, cycadeæ, and coniferæ, bear the nearest relations to the earliest forms of vegetation that have existed upon our planet.'*

ANIMAL REMAINS.

In general, as we have seen, it may be asserted that the earliest forms of animal life that appeared on the globe belonged to the sub-kingdoms RADIATA, MOLLUSCA, and ARTICULATA, while the VERTEBRATA were of later origin, making their appearance first in the class of fishes, next in that of reptiles, then in that of birds, and lastly in that of mammalia. Fossil radiata, mollusca, and articulata, are accordingly found along the whole range of the fossiliferous strata, more or less abundantly, exhibiting, however, a gradual assimilation to existing forms as they approach the current era. Let us take these remains in their zoological order.

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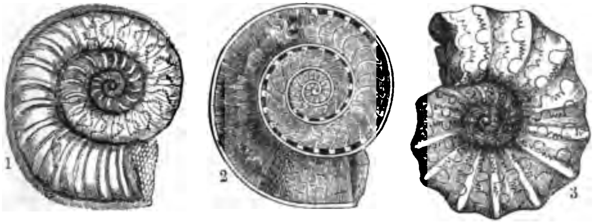
* Bridgewater Treatise, vol. i. pp. 520-523.

Fossil Radiata, Mollusca, and Articulata.—These remains, which are still in an unarranged condition, are at present deposited in the table-cases on the north side of Room V, where the visitor will find abundance of ancient corallines, sponges, crinoidea, and echinodermata, or star-fishes; shells both univalve and bivalve, including ammonites, belemnites (see Zoological Section—on cephalopod molluscs), &c. and also many specimens of trilobites, crustacea, &c. To a practised geologist such a collection presents a rich treat; and even the casual visitor, who may have accompanied us in our survey of the zoological section, will be able to recognise these fossils, and give them their proper zoological names.



1. Ammonites obtusus; 2. Section of Ammonites obtusus, showing the interior chambers and siphuncle; 3. Ammonites nodosus.

Fossil Fishes.—These occupy nearly the whole of Room V, and are arranged after the method proposed by Agassiz. This great naturalist finding Cuvier's twofold division of fishes into cartilaginous and osseous insufficient for geological purposes, has substituted for it a classification now universally adopted by geologists, arranging fossil fishes in four great orders, according to the nature of their scales. He finds also that 'other important distinctions of structure, &c. harmonise with these differences of scales.' This discovery is invaluable, for of all parts of fishes the scales are those most abundantly found in a fossil state; and if, by a single scale, the geologist can detect the order to which any fish belonged, he has also a clue to its habits and mode of life, and to the conditions under which it flourished. The following is a sketch of the divisions proposed by M. Agassiz:—1. Placoidians (Gr. *plax*, a broad plate).—Fishes of this order have their skin covered *irregularly* with plates of enamel, often of considerable dimensions, but sometimes reduced to small points, like the shagreen on the skin of the shark, and the prickly tubercles of the ray. It comprehends all the cartilaginous fishes (sharks and rays) with the exception of the sturgeon. 2. GANOIDIANS (Gr. *ganos*, splendour, from the bright surface of their enamel).—The fishes of this order are covered with angular scales, composed internally of bone, and coated with enamel. The scales are *regularly* arranged, and entirely cover the skin. Nearly all the species referred to this order are extinct; the *sturgeons* and *bony-pike* of the North American lakes are living examples. 3. CTENOIDIANS (Gr. *kteis*, genitive *ktenos*, a comb).—Ctenoid fishes have their scales of a horny or bony substance, without enamel, jagged like the teeth of a comb on the outer edge. The *perch* and many other existing genera are of this order, which contains but few fossil forms. 4. CYCLOIDIANS (Gr. *cyclos*, a circle).—'The fishes of this order have smooth, horny, or bony unenamelled scales, entire at the margin, with concentric or other lines on the upper surface. The *herring*, *salmon*, &c. belong to this order, which, along with the former, includes almost the whole number of existing species.'*

As the skeletons of fishes of the first or PLACOID order are of a soft cartilaginous nature, and consequently very perishable, the fossil remains of such fishes occur generally in the form of small detached portions of the whole body, such as teeth, palates, dorsal fins, &c. Specimens of these remains are placed in Table-Cases I-IV. Among the most remarkable are the ichthyodorulites, or fossil spines of extinct species of sharks. Of existing fishes of the shark family several have *horny* spines connected with the dorsal fin; but in only one, the *Cestracion Philippi*, or Port-Jackson shark, do we find a bony spine, armed like prickles, like these fossil ichthyodorulites. In this shark the spine acts as a movable mast, raising or depressing the sail-like fin as the animal moves; and the probability is, that the fossil spines served the same purpose to the fishes to which they belonged. Such spined sharks must have been extremely common in the ancient seas, for their spines are found in all the strata, from the grauwacke to the chalk inclusive, after which they seem to have been succeeded by sharks more closely resembling those now living. Of another great family of placoid fishes—the rays—fossil remains are found in strata from the lias or earliest oolite downwards.

The remains of GANOID fishes, which are far better preserved than those of the placoid, occupy Wall-Cases I-XVI. This order is divided into twelve families, the remains of which, with the exception of two, of which remains are wanting in the collection, are deposited in their proper succession. The formations in which they were respectively found are indicated by the tints of the labels on which the names of the species are inscribed; tablets explaining these tints being placed within the cases. The oldest specimens—as, for example, those of the family of the cephalaspids, together with some in the families of the acanthodians, the dipterians, and the cælacanths—belong to the old red-sandstone formation. Remains of fishes, possibly ganoid, have indeed been found in the highest of the silurian strata, known as the Upper Ludlow rocks; but there are none such in the museum, and accordingly the old red sandstone must be considered in the meantime as having furnished to our national collection the earliest remains of animals of the vertebrate sub-kingdom. The honour of having contributed to the museum the greater number of these valuable fossils belongs to Mr Hugh Miller, whose name is well known both in the literary and scientific world. Mr Miller's description of the general appearance of these fossil forms, as given in his work on the Old Red Sandstone, may be here transferred:—'A stranger assemblage of forms has rarely been grouped together—creatures whose very type is lost, fantastic, and uncouth, and which puzzle the naturalist to assign them even their class; boat-like animals, furnished with oars and a rudder; fish plated over like a tortoise above and below, with a strong armour of bone, and furnished with but one rudder-like fin; other fish less equivocal in their form, but with the membranes of their fins thickly covered with scales; creatures bristling over with thorns; others glistening in an enamelled coat, as if beautifully japanned—the tail in every instance among the less equivocal shapes, formed not equally, as it is in existing fish, on each side the central vertebral bone, but chiefly on the lower side, the bone sending out its diminished vertebræ to the extreme termination of the fin. All the forms testify of a remote antiquity—of a period whose "fashions have passed away." The figures on a Chinese vase, or an Egyptian obelisk, are scarcely more unlike what now exist in nature than the fossils of the lower old red sandstone.' One of the most remarkable of the families of ganoid fishes are the sauroids, or lizard-like fishes (Cases VII-X), which, though of extremely high organization, approaching reptiles in their structure, are found in the oldest secondary strata, very abundantly in the coal strata. Some of these extinct sauroid fishes must have been of large size; their only living representatives are the lepidosteus, or bony pike, and the polypterus. The most remarkable of the sauroid remains are those of the *Megalichthys Hibberti*, so called after Dr Hibbert, who first discovered remains of this kind in the Burdie-House limestone near Edinburgh.

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* Treatise on Geology, Chambers's Educational Course.

The CTENOID fishes, divided into nine families, occupy Wall-Cases XVII-XX; and the CYCLOID fishes, divided into ten families, occupy the remaining wall-cases (XXI-XXVII). Fishes of these orders were evidently much later creations than those of the placoid and the ganoid orders, for their remains do not occur in earlier strata than the chalk or latest secondary. Here, therefore, it is clear some great change in the condition of the world took place: the placoid and ganoid fishes, differing so singularly from existing forms, were all but extinguished; and new fishes, much more closely resembling those of the present era, were substituted for them. Nor did all the ctenoid and cycloid families come into existence at once, or last equally long. Some appeared with the chalk, and speedily became extinct; others, such as the herring and salmon families (Cases XXV-XXVII), appeared with the chalk, traversed the whole tertiary series, and have been perpetuated, though with a change of species, into the present era; while some, such as the cod and haddock, are confined to the present era, and are therefore coeval with man.

FOSSIL REPTILES.—The collection of fossil reptiles, which is perhaps the finest in the world, but the arrangement of which is not yet completed, occupies Room III and part of Room IV. The mere fact that so large a proportion of the Geological Section is devoted to these remains, indicates the important geological truth, that there was a time in the history of our planet when neither man nor any of the higher mammalia was the head of its animated creation, but when that place was occupied by reptiles, some of them of gigantic size, crawling and swimming in myriads in the marshes, rivers, and æstuaries of the globe, while the sea-depths were peopled with strange fishes, crustacea, and molluscs. Organic remains have been discovered pertaining to each of the four great reptile orders—the saurians, or lizards, the batrachians, or frogs, the chelonians, or tortoises, and the ophidians, or serpents. Comparatively the rarest are the remains of serpents; and as these remains are found only in the most recent tertiary strata, it is to be presumed that serpents had no place in the Fauna of the earlier world, and that the reptile class then included only the other three orders. Of these the saurians appeared first, their remains being found immediately above the coal in the magnesian limestone; the batrachians come next with the new red sandstone; while the chelonians are deferred till the oolite.

Of the batrachian remains in the museum (Room III, Wall-Case I), the most remarkable is the fossil salamander, which formed the subject of a famous essay, published in 1726, by a naturalist named Scheuchzer, under the title of 'Homo Diluvii Testis et Theoscopos'—('Man, the Witness of the Flood, and Beholder of God'). Scheuchzer, who regarded all organic remains as relics of the great Mosaic deluge, was delighted beyond measure when he obtained from the Oeningen beds (which belong to the meiocene, or second period of the tertiary formations) a fossil which, in size and appearance, bore some resemblance to a human skeleton; and on this fossil, taking it for the actual remains of a human being, he accordingly founded his dissertation. Although, as Cuvier remarked, the simple comparison of the fossil with a human skeleton would have overturned Scheuchzer's hypothesis, his enthusiasm so far blinded people, that not till many years afterwards was the belief abandoned. Cuvier himself, in 1811, demonstrated the fossil to be that of a batrachian of the family of salamandridæ. To a creature of the same order and the same family are probably to be referred the remarkable footprints on the new red sandstone slabs placed on the north wall of Room I. One of these slabs is from the quarries of Hilburghausen in Saxony, the other is from those of Storton Hill near Liverpool, both discovered some ten or twelve years ago. The marks on the sandstone were in both cases recognised as the footprints of some quadruped whose hind-feet were considerably larger than its fore-feet; but as the animal itself could not be determined, it was agreed to call it provisionally by the name of *Chirotherium* (hand-beast), in allusion to the resemblance of the marks to the impressions of a human hand. Mr Owen has recently all but demonstrated that this chirotherium can have been no other than a gigantic batrachian, called *Labyrinthodon* (on account of the peculiar structure of its teeth), partial remains of which have occasionally been discovered independently in the new red sandstone.

The chelonian remains have not yet been presented to public view; they are to be arranged in Room II, where already (Wall-Case V) may be seen the carapace and other parts of a gigantic fossil tortoise (*Megalochelys Atlas*), discovered by Major Cautley in the Sewalik Hills, Bengal.

The saurian remains are by far the most numerous and interesting of fossils of the reptile class, if not, indeed, of all fossils whatever. In Wall-Cases I-IV of Room III are arranged the remains of extinct land saurians, or lizards, while in Wall-Cases IV-VI of the same room, and in Wall-Cases I-V of Room IV, are deposited the remains of a distinct order of so-called lizards, to which nothing at all analogous now exists—the enaliosauria, or sea-lizards.

To the former belong various remains of animals resembling the gavials and crocodiles in their general form and habits—such as the *teleosaurus*, the *geosaurus*, the *iguanodon*, &c. each name indicating a distinct genus. Some of these extinct crocodiles were of enormous size. Thus the iguanodon (Case III), which was a herbivorous animal like the modern iguanas, must have attained a length of 70 feet, and a circumference of about 14½ feet; the thigh-bone is much thicker than that of any elephant. The circumstance that remains of such animals are found in Great Britain, shows that the climate of this region must have been at one time hotter than it now is, and that there must have been creek-shores and river-banks clothed with rank vegetation, like the banks of the Nile and the Ganges. To the same general division as the foregoing belong the *mososaurus*—a gigantic alligator that seems to have lived entirely in the water—and the *hylæosaurus*, or wealden lizard, so called because it occurs in the Kentshire wealds or wolds (part of the oolite), which have also furnished abundant remains of the iguanodon and other reptiles. The *hylæosaurus* was about 25 feet long; its most remarkable characteristic being an enormous dermal fringe which it possessed, like the spines on the back of an iguana. But by far the most extraordinary of these primitive lizards was the *pterodactyle*, of which there are remains in Case II. 'Mainly a reptile of the lizard kind, its body possessed some of the characteristics of the mammalia: it had the wings of a bat, the neck of a bird, and a head furnished with long jaws full of teeth, so that in this last part of its organization it bore some resemblance to the crocodile. Eight species of the pterodactyle which have been found vary from the size of a snipe to that of a cormorant. The eyes were of enormous size, apparently enabling the animal to fly by night. From the wings projected fingers, terminated by long hooks, like the curved claw on the thumb of the bat. These must have formed a powerful paw wherewith the animal was able to creep or climb, or suspend itself from trees. It has been conjectured that the pterodactyle would live chiefly on flying insects; and it is likely that it searched for its prey by night as well as by day. But it has also been argued, from the great length and strength of the jaws and the length of the neck, that the pterodactyle did not live solely upon flies, but likewise sought for fish in the manner of our present sea-birds.' Cuvier pronounced the pterodactyle to be the most extraordinary extinct animal known, and the one which, if restored to life, would most astonish us by its singularities of aspect and habits; and in allusion to its power of adapting itself to so many elements, naturalists have usually applied to it Milton's description:—

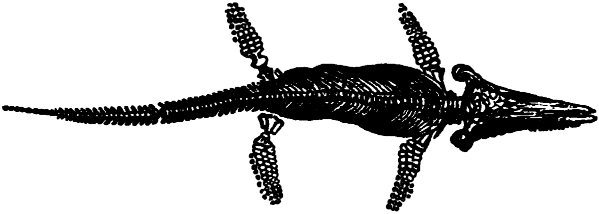
——— 'The fiend
O'er bog or steep, through straight, rough, dense, or rare,
With head, hands, wings, or feet pursues his way,
And swims, or sinks, or wades, or creeps, or flies.'

Of the enaliosauria, or sea-lizards, there are two principal types, both amply represented in the museum—the *plesiosaurus* (Room

III, Wall-Cases IV-VI), and the *ichthyosaurus*, or fish-lizard (Wall-Cases of Room IV).

Of the former of these extraordinary marine reptiles, the first remains were discovered about the year 1823 in the lias (lowest oolite) of Lyme-Regis. From these remains Mr Conybeare restored the form of the entire animal so successfully, that after specimens had been discovered nearly perfect (several of which are in the museum), the restoration was found scarcely to differ from the actual skeleton. The form of the plesiosaurus appears at first an aggregation of incongruities. 'To the head of a lizard,' says Dr Buckland, 'it united the teeth of a crocodile; a neck of enormous length resembling the body of a serpent; a trunk and tail having the proportions of an ordinary quadruped, the ribs of a chameleon, and the paddles of a whale.' The chief species of the genus are the plesiosaurus dolichodeirus and the plesiosaurus hawkinsii, both of which attained a gigantic size. In the plesiosaurus dolichodeirus the neck exceeded in length the body and tail together; consisting of no fewer than thirty-three vertebræ, which is about ten more than compose the neck of a swan. Mr Conybeare thus describes its habits:—'That it was aquatic, is evident from the form of its paddles; that it was marine, is almost equally so from the remains with which it is universally associated; that it may have occasionally visited the shore, the resemblance of its extremities to those of the turtle may lead us to conjecture; its motion, however, must have been awkward on land, and its long neck must have impeded its progress through the water. May it not, therefore, be concluded that it swam upon or near the surface, arching back its long neck like a swan, and occasionally darting it down at the fish which happened to float within its reach? It may perhaps have lurked in shoal water along the coast concealed among the seaweed, and raising its nostrils to a level with the surface from a considerable depth, may have found a secure retreat from the assaults of dangerous enemies.'

Of the ichthyosaurus, or fish-lizard, seven or eight species have been identified from their remains found in the oolite. Among these are the ichthyosaurus platyodon, the ichthyosaurus latifrons, the ichthyosaurus intermedius, the ichthyosaurus longipinnis, &c. &c. of all which there are specimens in Room IV. The following description applies in the main to all these species:—'The head is, like that of the crocodile, composed of two long slender jaws provided with a great number of teeth (in some cases 180), and eyes of great size (in one instance the cavity for the eye measured 14 inches across), while the nostril, instead of being near the snout, as in the crocodile, was near the anterior angle of the eye. The body was fish-like, arranged upon a long spinal column, which consisted of more than a hundred joints, and to which a series of slender ribs was attached, and terminating in a long and broad tail, which must have possessed great strength. The whole length of some specimens of the ichthyosaurus is about thirty feet. Instead of the feet with which the lizard and the crocodile are furnished, the ichthyosaurus had four paddles like those of the whale tribes, fitting it to move through the waters in the manner of those animals. It had also a construction of the sternum, or breast-arch, and of the four paddles similar to that found in the ornithorhyncus of New Holland (see Zoological Section), and evidently designed, as in the case of that animal, to enable it to descend to the bottoms of waters in search of food. While, therefore, the ichthyosaurus is mainly allied to the lizard tribes, it combined the additional characters of the fish, the whale, and the ornithorhyncus. The internal structure and the modes of living of the ichthyosaurus have been in a most unexpected manner made clear by the discovery of the half-digested remains of animals found within them or in their neighbourhood. It appears that the creature possessed a large stomach, extending throughout nearly its whole body, and that it lived upon fish and other reptiles, including its own kind. It must have occasionally devoured creatures several feet in length.'



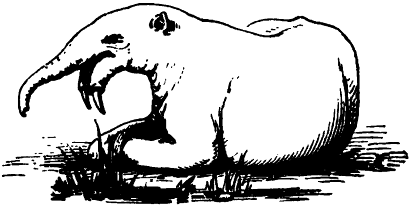
Fossil skeleton of Ichthyosaurus.

FOSSIL BIRDS.—The reason of the comparative rarity of remains of birds even in strata with which they must have been contemporaneous, is thus stated by Mr Lyell:—'We might have anticipated that the imbedding of the remains of birds in new strata would be of rare occurrence, for their powers of flight insure them against perishing by numerous casualties to which quadrupeds are exposed during floods; and if they chance to be drowned, or to die when swimming on the water, it will scarcely ever happen that they will be submerged so as to become preserved in sedimentary deposits. In consequence of the hollow tubular structure of their bones, and the quantity of their feathers, they do not sink to the bottom like quadrupeds, but float on the surface until the carcase either rots away or is devoured by predacious animals.' Still, we have sufficient data for ascertaining the general facts of the history of birds as part of the animal kingdom of the preadamite earth. Appearing first in the form of waders at the time of the deposition of the chalk or latest secondary, they probably abounded during the tertiary period (in some of the strata of which their remains have been found), presenting forms analogous to many still existing, but some also that are now totally unknown. Among the latter was a bird of enormous dimensions. Slabs of sandstone had been found both in England and North America exhibiting what are called *Ornithichnites*—namely, bird-foot-marks; of which some were so large, that it appeared incredible that they could have been made by a bird: Professor Owen, however, on examining some bones that were sent over from New Zealand, found them to consist of the remains of no fewer than nine distinct species of one genus of wingless birds of enormous size, which he called *Dinornis* (literally, 'tremendous bird'). This bird must have stood ten or eleven feet high. Specimens of its bones are placed on the upper shelf in Wall-Case III of Room II. From the fact of the correspondence of these New Zealand fossils with ornithichnites found in the sandstones of Connecticut in North America, the important conclusion has been drawn, that these two far-distant spots are the extremities of what was once a vast continuous continent, the intermediate portions over which the dinornis once walked being now submerged.

FOSSIL MAMMALIA.—These remains are at present distributed in a state of confusion through Rooms II, IV, V, and VI, and some time must elapse before they can be put in order. Glancing at the heaps of bones lying like lumber in Room VI, one is reminded of the celebrated description given by Cuvier of the manner in which he began his labours among the fossils that had been brought together from the gypsum quarries of Montmartre:—'I found myself,' he says, 'as if placed in a charnel-house, surrounded by mutilated fragments of many hundred skeletons piled confusedly around me: the task assigned me was to restore them all to their original position. At the voice of comparative anatomy every bone and fragment of a bone resumed its place. I cannot find words to express the pleasure I experienced in seeing, as I discovered one character, how all the consequences I predicted from it were successively confirmed. The feet were found in accordance with the characters announced by the teeth; the teeth in harmony with those indicated beforehand by the feet; the bones of the legs and thighs, and every connecting portion of the extremities, were found set together precisely as I had arranged them before my conjectures were verified by the discovery of the parts entire.'

With the exception of a few supposed remains of extinct marsupial animals found in the later oolite, no fossils of mammalia have been found in any formation older than the tertiary. At the commencement of this period we are to suppose that the globe presented large continents of granitic hills, with attached marshy land, stretching along the seas; these continents traversed by rivers, and containing numerous lakes both of salt and fresh-water. It was then that mammalia first appeared on the lands that had hitherto been possessed only by reptiles. The banks of the lakes and rivers teemed with vast herds of animals of the pachyderm order, allied in appearance and habits to the tapirs of South America and Sumatra. As the lands became still more habitable, other terrestrial mammalia succeeded—marsupial animals in abundance; carnivora, such as at present inhabit tropical jungles; rodentia; cheiroptera, or bats; and lastly, ruminant animals of the ox family; while, partaking of the same general improvement of conditions, the sea became tenanted by marine mammalia of the order cetacea—such as whales, dolphins, seals, walruses, &c. In short, before the close of the tertiary period, the earth contained representatives (more or less resembling those which now exist) of all the great orders of animated existence, with the exception of the highest mammalia or superior primates. The remains of these animals sinking in lakes, or carried down by rivers, became imbedded in the great fresh-water deposits that now constitute the so-called tertiary basins which occur at intervals over the face of the globe. These deposits have been divided by geologists into four series of strata, called respectively the *Eocene*, the *Meiocene*, the *Older Pleiocene*, and the *Newer Pleiocene*. This division, adopted for purposes of convenience, is founded on the proportions which the fossil shells in the different strata bear to marine shells of existing species. Thus in the eocene, or oldest tertiary deposits, when the earth was but beginning to assume its present conditions, only 3½ per cent. of the shells are of species still existing; in the meiocene, the proportion rises to 18 per cent.; in the older pleiocene, it varies from 35 to 50 per cent.; and in the newer pleiocene it is as high as from 90 to 95 per cent.

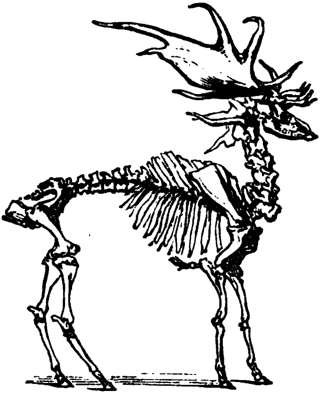
Of the eocene or oldest tertiary deposit perhaps the most interesting fossils are those of the *palæotherium*, a genus of pachydermata combining the characters of the horse, the rhinoceros, and the tapir; the different species, of which there were about twelve, varying from the size of a hog to that of a horse. The animal probably lived and died leisurely on the swampy banks of rivers and lakes, along with other genera of pachydermata of different appearance, disputing the ground with crocodiles and saurians, while wolves, foxes, racoons, squirrels, &c. all of extinct genera, lived in the jungles near; and buzzards, quails, owls, curlews, &c. also of extinct genera, hovered overhead. In the next, or meiocene period, the palæotherium gives place to the *deinotherium*, or gigantic tapir (see a cast of skull, and some other remains in Room VI), the largest of terrestrial mammalia yet known. 'No complete skeleton has yet been discovered; but from the bones found, Cuvier and others imagine the animal to have reached the extraordinary length of eighteen feet. The most remarkable peculiarities of its structure consisted in two enormous tusks at the end of its lower jaw, and in the shoulder-blade, which resembled that of a mole, and was calculated to give the power of digging to the fore-foot.' Living in fresh-water lakes, to the banks of which it could hang on by its tusks, this stupendous animal probably resembled the walrus in its habits, procuring food by grubbing up roots, &c. from the bottom of the water. Around it were other pachydermatous animals of strange forms—some like swine, some like tapirs, some like rhinoceri; reptiles of the crocodile kind still abounded; in the jungles near were animals of the cat and dog kinds, some as large and fierce as lions; overhead flew numerous birds; and in the seas swam walruses, seals, and whales. Such was the animal kingdom of the Meiocene Period; but with the dawn of the Pleiocene Periods came a change.



Restored Form of Deinotherium.

The chief animal of these periods was the *mastodon* (of the various species of which there are numerous remains in Room VI), a gigantic animal of the elephant kind. 'In height the mastodon seems to have been about twelve feet. The whole arrangement of its bony structure resembled that of the elephant, excepting in one point, which Cuvier regarded as of sufficient consequence to constitute the mastodon a different genus: this was the cheek-teeth, which were arranged, not like the elephant's, but like those of the wild boar and hippopotamus; whence it was concluded that, like the latter animals, the mastodon must have lived on tender vegetables, roots, and aquatic plants, and could not have been carnivorous. Like the elephant, the mastodon had two tusks curving upwards, and formed of ivory; and in the opinion of Cuvier it had also a trunk of the same kind as the elephant's.' Contemporary with the mastodon was a gigantic animal of the edentate order called the *megatherium*. Remains of this extraordinary animal (of which there are specimens in Room II) have been found both in North and South America; one skeleton almost entire was found near Buenos Ayres. In structure, the megatherium combined the characters of the sloth, the armadillo, and the ant-eater, having the head and shoulders of the first, with the bony armour of the two latter animals, whom it also resembled severally in different parts of its legs and feet. 'Its haunches,' says Dr Buckland, 'were more than five feet wide, and its body twelve feet long, and eight feet high; its feet were *a yard in length*, and terminated by most gigantic claws; its tail was probably clad in armour, and much larger than any other beast among living or extinct terrestrial mammalia. Heavily constructed, and ponderously accoutred, it could neither run, nor leap, nor climb, nor burrow under the ground, and in all its movements it must necessarily have been slow. But what need of rapid locomotion to an animal whose occupation of digging roots for food was almost stationary? And what need of speed of flight from foes to a creature whose giant carcase was encased in an impenetrable cuirass; and who, by a single pat of his paw or lash of his tail, could in an instant have demolished the cougar or the crocodile? Secure within the panoply of his bony armour, where was the enemy that would dare encounter this behemoth of the pampas, or in what more powerful creature can we find the cause that has effected the extirpation of his race?' Surrounded by mammalia of other orders—such as carnivora, ruminants, &c.—hovered over by birds, these giants of the Pleiocene Period preceded man as the sovereigns of the globe.

At length the great change arrived: when the seas and dry lands of the globe had assumed nearly their present relative positions and proportions, the present animal system arose. Into a world consisting of the wrecks of all the radiata, articulata, mollusca, and vertebrata that had gone before, man was ushered, together with all the new animals that were created along with him; and their history interwoven with his, and with that of such of the previous animals as survived, constitute the current geological era. To fix the exact date of man's appearance on the planet is not possible; clearly, however, it is a very recent event. In the whole series of geological strata, from the lowest primary to the latest pleiocene, no fossil human skeleton has been found; the appearance of man on the planet was therefore posterior to the existence of all those animals whose remains are found in any of the true stratified rocks. But in the superficial deposits of diluvium mould, &c. that overlie the true geological strata, are entombed millions of remains of animals that have lived and died since the current era began. These are almost universally found to be the bones of animals that still exist. Species, indeed, that were contemporary with the earlier ages of human history have died out; one complete *genus*, that of the bird dodo, has disappeared; and it seems even probable that the *mastodon* genus of pachyderms has become extinct in America since it was inhabited by man. But although these facts testify that the same great forces of change are still at work that have extinguished the whole series of races whose fossils we now dig up out of the stratified rock, what a length of ages must elapse before the present animal creation shall have been extinguished and fossilised in a similar manner! Or shall the time ever come at all when, our present churchyards and burying-places, covered perchance by the sea, shall be but collections of fossil human beings, down into which the future geologist of the globe will dig for specimens of a race that once existed; and when, in some future scheme of fossil zoology, man shall figure at the head of a list of extinct vertebrate animals with whose remains his will be found associated?



Fossil Elk.

Such are the reflections that occur as one looks at the fossil human skeleton which is placed against the wall of Room VI, so as naturally to close the long series of animal remains exhibited in the gallery. This skeleton, which was brought from Guadaloupe not many years ago, was one of a number that were found imbedded in solid limestone rock at a place on the seashore of that part of the world. That the rock is very recent is proved by its composition, which is that of a vast number of fragments of shells, corals, &c. all of species still existing in the neighbourhood, agglutinated together by the action of the sea, in a manner common enough on tropical shores. The probability is, that the spot, while yet a mere sandy bank, was used as a place of interment, for fragments of pottery, hatchets of stone, and other weapons, were found in the rock along with the bodies, some of which were in a sitting, and some in a lying posture. The fossil skeleton, therefore, that closes the exhibition in the North Gallery may be but a few centuries old—the bony framework of some Carib Indian that lived and died about the time that Columbus was preparing for his voyage across the Atlantic. Still exemplifying as it does the aspect that all the human bodies buried in the earth must, if they last at all, ultimately assume; and suggesting as it does so many strange questions relative to the future destinies of the earth, such a sight is deeply interesting. Shall there ever be on this earth intelligent beings capable of studying such remains, and yet not possessing the organization that they present; or shall the only creature that shall ever wonder over fossil men be man himself? On these mysteries no one can speak surely; but there is one great consideration from which man would fain derive the conclusion that he himself is the climax of that animal creation whose history he traces through the long suite of past ages: this is the enormous interval between himself and all beneath him in the scale of animated nature. When, after ages of preparation, a being was ushered into the world, so diverse as man from all that had gone before, gifted with reason that has enabled him to subdue the earth, measure it, clothe it with civilisation, and almost reduce it to the dimensions of a mass to be handled as a whole, does it not seem that the end was then arrived at, at least as regards the planet, and that whatever physical revolution now remains, must be one of mere universal nature affecting all the spaces? And even with that possible future, are not the destinies of man connected by his hopes of immortality?

Fossil Skeleton.

ANCIENT SCULPTURES.

The fine arts, which are usually reckoned to be five in number, have been judiciously arranged by a French philosophical writer in the following order:—1. Poetry, which is the most general in its nature, having the whole field of human language for its domain, and which requires the least amount of technical training in those who practise it; 2. Music, which is more limited in its range than poetry, although more energetic in its effects, and which requires also a larger amount of special technical training in those that would practise it; 3. Painting, which is still less general in its nature than music (not being able, for example, to exhibit the succession of time, but being obliged to seize some single moment of the action that it wishes to represent), and which requires a still longer apprenticeship in its practitioners; 4. Sculpture, which is less general and more technical than even painting; and 5. Architecture, which of all the arts is the least general, and the most technical in its nature, occupying as it does that point where the æsthetic passes into the mechanical.

Very needless discussions have been raised on the question of the relative priority of these arts, some maintaining, for example, that painting must have preceded sculpture, others that sculpture must have preceded painting. That the primitive civilised nations of the world may have made considerable progress in some of the arts before they had advanced far in the others, may be readily admitted; and, on the whole, the likelihood is, that the least technical arts were the first to attain a standing in society; but farther than this nothing can be affirmed with certainty; and we shall probably do more justice to the subject if, instead of attempting to settle the relative priority of the arts, we conceive them all to have originated contemporaneously in the common æsthetic propensity of human nature, however variously their subsequent growth may have been determined by circumstances. The first man that, under the influence of any strong emotion, expressed his meaning in metaphoric language, and with a measured cadence of the voice, was a poet; he who first, abandoning the words that emotion had begotten, prolonged the cadence for its own sake, and found delight in some fortunate succession of inarticulate sounds, was a musician; he who first imitated forms on the face of a rock with a piece of burnt wood was a painter; he who first moulded a lump of clay into a grotesque human head was a sculptor; he who first, in building a hut, made an effort to add some little superfluity that would please the eye, was an embryo architect. It is absurd to speculate which of these incidents was likely to happen first in one of the world's rude primitive communities, seeing that all may have happened together, under the influence of the common feeling which leads mankind to delight in imitation, or in beauty, whatever be its kind.

And if it is absurd to inquire in what order the arts arose, it is equally absurd to inquire in which particular nation of antiquity they had their origin, or how they were communicated from one nation to another. To say, for example, that the Greeks derived their first ideas of sculpture from the Egyptians, or their earliest music from the Phrygians, is a misuse of words. On no one spot of the globe in particular did any of the arts arise; but wherever there was intellect and feeling for beauty, there, according to the facilities of the locality, did the artistic tendency develop itself. Technical devices in the various arts may, indeed, have been borrowed by one nation from another; the Romans, for example, may have borrowed a particular poetic metre from the Greeks, and the Greeks a particular style of music from the Phrygians; but the arts themselves are indigenous, everywhere shooting up wherever there is the soil of a powerful human nature to afford them nourishment, and partaking of the peculiarities of that human nature. But seeing that Humanity does not attain the same maturity everywhere at once, but is rich and fertile at one place, while it is rude and poor at another, and seeing that different parts of the earth have at different times enjoyed singular pre-eminence in this respect, it may in a certain sense be said that there has been a historical progress of the arts through different nations from the earliest times to the present day—this progress being along the exact line of the world's civilisation. Thus in the earliest stages of the world's history, we may regard the whole artistic genius of the human race as having been concentrated and represented in that fragment of the primitive Caucasian stock that dwelt in the valley of the Nile; somewhat later, the historian of art must extend his view to the other civilised Oriental nations—the Assyrians, the Jews, the Indians, &c.—that ultimately were included, along with the Egyptians, in the Persian empire; thence stepping westward, he must investigate the wonderful progress in the arts that was achieved by the Greek peoples; after which, descending through the Roman times, and the gorgeous ages of the Catholic church, he must reach the wide and various field of the modern European world.

In the department of the museum on which we have now entered there are materials for a historical survey of the progress of at least *one* of the arts of antiquity—the art of sculpture. The examples of this art, being more durable than those of the sister art of painting, have survived to us from the ancient world in far greater numbers; while their portability has given them an advantage of another kind over mere architectural remains. If, therefore, it may be said that it is only of the poetry, the sculpture, and the architecture of the ancients we are still able to form an idea at first hand, whereas of their music and their painting we can judge only through tradition; it is yet true that of all the five arts, sculpture is that of which we can trace the progress most uninterruptedly over the longest period of time. In the EGYPTIAN SCULPTURES of the museum, for example, we behold the artistic products of an ancient people, not a verse of whose poetry, not a strain of whose music, has survived to us, while of their paintings there are but few remaining specimens, and their architectural monuments, though numerous, are inaccessible except to travellers; thence passing to the ASSYRIAN SCULPTURES that have recently been added to the museum, we witness the products of a somewhat later period, and of a different national genius, of whose existence almost all other testimonies have long since vanished; after which, walking through the galleries containing the various suites of GREEK MARBLES, we see the art attaining its highest condition among a people whose poets, painters, architects, and possibly also musicians, were all alike great; and lastly, in the ROMAN STATUES we trace the same art continued through a later age, by a great people of less artistic genius. Thus in this single department of the museum we have ancient art represented to us in four successive styles or phases—the Egyptian, the Assyrian or Semitic, the Greek, and the Roman; under one or other of which heads it is probable that all the products of ancient art that either now exist, or that ever existed, might be arranged. In describing the sculptures, therefore, we shall follow this order.

I.—Egyptian Sculptures.

The origin of the art of sculpture among the ancient Egyptians is involved in the general obscurity which hangs over the early history of that remarkable people. Suffice it to say, that at the remotest period to which the records or traditions of our race reach back, at a period when probably only a few fertile Asiatic spots of the globe were colonised, and all the rest of its surface was uninhabited, sculpture was a recognised profession on the banks of the Nile, affording a means of livelihood to thousands of human beings. The neighbouring tribes and nations had, indeed, arrived at the rudiments of the art; for what wandering tribe of Arabs, or what Ethiopian community can we picture so rude as not to have practised that primitive kind of sculpture which consists in partially hewing and then setting up a block of stone, whether to serve as an altar for sacrifice, as an object of worship, as a tombstone for the dead, or as a simple memorial of some important transaction that had taken place at the spot (see Genesis, xxviii. 18; xxxi. 44; xxxv. 20, &c.)? But the Egyptians had improved upon this. Led to higher efforts in the art by the abundance of excellent material that was at hand in their quarries, as well as by those innate superiorities of disposition and talent that enabled them to turn this and all their other opportunities to advantage, they were not content on such occasions as those mentioned with merely setting up a roughly-hewn stone—they bestowed pains on shaping and carving this stone till it assumed a form worthy in their eyes of the purpose for which it was intended. The same indomitable tastes and instincts that induced them to hollow out with immense labour huge temples in the solid rock, while less civilised tribes were satisfied with natural caves or rude huts, induced them also to chip and smoothe with infinite care the block which such comparative savages would have used in its native state. To modify external nature according to one's internal frame of mind, to produce in the substances about one some likeness to, or representation of, the state of feeling within, is the aim of the civilised man, and this is *art*. The first displays of the tendency are in mere efforts of imitation—as when the savage chalks or carves a rude figure of a human head; but as civilisation advances, art keeps pace with it, till at length the cultured man acquires the power of rendering on the canvas or in the marble all that is complex or delicate in the workings of his own soul. That some Egyptian must have begun the process by showing to his countrymen the first specimen of imitative carving, is true; but who he was that did so, or when he lived, no one can say. The example once set, the progress in the art must have been fast enough among so superior a people. Artist after artist must have sprung up, till at length, out of their joint efforts, in subordination to the tastes of the people and the authority of the priests, the national style of sculpture had completely formed itself—assumed, that is to say, the peculiar characteristics that we recognise with a certain license of variety in all Egyptian sculpture. This, according to Sir J. G. Wilkinson, must have been prior to the reign of the Pharaoh Osirtasen I., who was a contemporary of Joseph (B.C. 1740), and sculptures marked with whose name are still extant.

One general fact may be affirmed regarding this progress from the unknown beginnings of Egyptian sculpture to the completed style of the art under Osirtasen I.—namely, that the first exercises of the art were sculptures in relief, and that the practice of sculpturing detached figures arose later. 'It is not difficult,' says Professor Long, 'to trace Egyptian sculpture to its elementary essays. Rude outlines on the smoothed face of a rock were the sculptor's first attempt. He would then try to give roundness and relief by cutting away the stone all about the figures; and as it would be an unnecessary labour to cut away a large surface of rock, this process resulted in the deep niche containing a statue in high relief. That Hindoo sculpture in stone might have had a similar origin we are inclined to believe, both from the facilities presented for such essays in the enormous rocky masses which the Indian peninsula contains, and from the drawings of the figures on the Fakir's Rock in the Ganges. These are figures in high relief, but sunk deep in a niche, the plane of which appears considerably below that of the general surface of the rock; many of the sculptures at Elephanta also are only just fastened with their backs to the wall. Though the Egyptian artist at last learned to separate the block of stone from the parent mountain, he never ventured to deprive his statue of the squared pillar at the back, which remained to the latest age of genuine Egyptian sculpture as a memorial of the earliest efforts of the art. Egyptian statues, even those of the most colossal dimensions, are formed of a single block; and as this *unity of mass* seems to have been the leading idea of the artist (which, as we have remarked, had its origin in sculptures of the native rock), the whole attitude of the detached figure was made subordinate to this principle.'* The visitor of the museum may easily verify these remarks by looking at any of the larger statues. All of them are of one mass; and at the back of each will be found the square pillar spoken of, the last remnant, as it were, of the rough rock out of which they were cut. In no genuine Egyptian statue of large size is this pillar wanting; the Egyptian sculptors on stone never having learnt to represent the human figure in a completely detached state, with the back thoroughly sculptured out like the breast.

After having thus advanced from their original attempts at rock-carving, in intaglio and in relief, to the execution of complete statues composed of single blocks, the Egyptians continued to practise both kinds of sculpture during their whole existence as a people. At some periods, and particularly during the reign of the great Pharaoh Rameses II. (B.C. 1350-1310), the art met with signal encouragement: vast works were undertaken in different parts of the country; and, as a natural consequence, artists of genius and skill became numerous. At other times the art declined, and the few works that were undertaken were executed in a slavish and slovenly manner. But though such vicissitudes were inevitable as regards execution, it is a remarkable fact that during the whole period over which the art extended—namely, from the reign of Osirtasen I. (1700 B.C.), to the time when Egypt was a Roman province—no real change of style was introduced, no novelty of method put in practice by Egyptian sculptors. The statues executed by native Egyptian artists in the time of Augustus Caesar were precisely like those executed by artists in the same country before the exodus of the Israelites. This, however, was but part of that general stationariness and adherence to established custom in which the Egyptians seem to have surpassed every other people, even the Hindoos. Sculpture being in itself almost a sacred profession, intimately connected both with the theology and the politics of the nation, would be specially liable to this general law of permanence. It must have been under the superintendence of the priests, and in obedience to their ordinances, that all the sculptors of Egypt worked; and, among a people of such fixed habits of thought and belief, to alter by ever so little in a statue of any deity the expression of countenance, or the style of head-dress that had been appropriated to him, would have been accounted sacrilege. In the representations of animals, indeed, the artists of Egypt appear occasionally to have worked with considerable boldness; but in representing the human form, or in sculpturing the sacred symbols of religion, they were rigidly confined within a narrow circle of conventional rules, and were obliged to display their talent rather in correctness and finish than in conception. The sameness of expression and want of freedom in Egyptian sculptures have been attributed by some to the want of good human models that must have been experienced, it is said, among a people whose bodies were deficient in that athletic grace and beauty that distinguished the Greeks; and by others to the want of anatomical knowledge among the artists. Allowing, however, that these causes did operate, their influence must have been quite subordinate to that of the more general cause just mentioned—the stringency, namely, of the Egyptian civilisation in all matters of custom. Yet even under such restrictions, artistic merit could make itself known; and on looking at a collection of Egyptian sculptures, monotonous and expressionless as they seem when tried by a modern standard, one has no difficulty in distinguishing which were the work of men of genius, and which of ordinary artisans. On the whole, perhaps, the sculptures of the reign of Rameses II. are the finest; thence to the conquest of Egypt by Cambyses (B.C. 525), many excellent works were produced; after that, and during the periods of Greek and Roman domination, the art declined.

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* Long's 'Egyptian Antiquities.' Society for the Diffusion of Useful Knowledge.

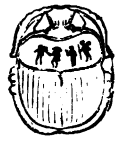
Specimens of Egyptian sculpture were prized as rarities by the Greeks and Romans; and even before the Christian era, many Egyptian obelisks, statues, &c. were carried out of their native country and distributed over the civilised world. During the early centuries of our era also many sculptures were abstracted from Egypt to adorn collections in Rome and Constantinople. These spoliations chiefly affected Lower Egypt or the Delta, whence the carriage of the relics to the sea was easy; the monuments of Middle Egypt, Upper Egypt, and Nubia, above the cataracts, were left comparatively untouched. The havoc committed on these by time and by the hands of the uncivilised inhabitants of the country, during the middle ages and recent times, has doubtless been considerable; still, many have survived above ground till this day, and of the numbers that may be buried under the accumulated sand and débris, it is impossible to form an idea. Of those yet discovered, thousands which admitted of being removed have been floated down the Nile in rafts or boats, and carried across the Mediterranean to the different museums of Europe. The places where such remains have been generally found are the sites of the most noted ancient Egyptian towns, and particularly the neighbourhood of celebrated ancient temples. The spot in all Egypt where relics of Egyptian art exist in the greatest abundance is the site of the once famous Thebes—the No of Scripture, and the 'hundred-gated Thebes' of Homer; the ancient capital of the whole country, and subsequently the capital of Upper Egypt. This gigantic city, the ruins of which astonish the traveller, consisted of two parts, one on the eastern, the other on the western side of the river, and each extending back to the mountains that wall in the valley. The vast assemblage of wooden houses which once occupied this huge space have long since vanished; but the more durable edifices and sculptures of stone still survive—straggling like wrecks of ancient grandeur through the modern Egyptian villages of Luxor and Carnak on the eastern, and those of Gournou and Medinet-Abou on the western bank of the river. In the parts that were once inhabited by the living, are temples, obelisks, colossal statues, &c.; while on the western bank, beyond the space once inhabited by the living, is a city of rock tombs where were deposited the bodies of the dead Thebans, generation after generation, and where the sculptures and the paintings are still fresh, as if newly executed. What renders these monuments more interesting is, that they may all be assigned, almost with certainty, to an extremely early period in Egyptian history—at least prior to the Persian invasion. A large proportion of the Egyptian relics of all kinds that figure in museums are from Thebes and its neighbourhood; the remainder come from the sites of other ancient cities; but some have passed through so many hands, that the place of their original discovery has been forgotten.

The sculptures contained in the Egyptian Saloon in the British Museum comprise about 800 distinct objects of different sizes and different values. Among these are presented two distinct kinds of sculptures:—1*st*, Carvings, in which, on a block or slab previously shaped, the artist has chiselled out certain figures or inscriptions; and 2*d*, Detached figures or statues. In many of the objects there is a combination of both, the artist having added subordinate carvings to the surface of a mass of elaborately-detached sculpture; but in such a description as the present, it is better to attend first to the mere carvings, and thence to proceed to the sculptures, properly so called.

The simplest specimens of carving in the saloon are the hieroglyphic inscriptions to be seen on almost all the objects it contains, whether on the mere slabs or blocks, or on the pedestals and other parts of statues. There is no more striking evidence of the civilisation of the Egyptians than the abundance of such inscriptions. What printing is to us, hieroglyphic writing was to the Egyptians. An ancient Egyptian could not enter a temple, could not walk along the streets of a city, could not explore a catacomb, but on the walls around him and above him he would see hieroglyphic inscriptions: some, mere brief intimations of a name or a date; others, sentences of prayer or religious addresses; others, long records of important national events. Wherever a stone was set up, or a building erected for any purpose, there was sure to be carved on the face of it a greater or less quantity of hieroglyphic writing to tell what that purpose was—a habit which may perhaps be attributed partly to the pleasure which the ancient Egyptians may have had in the mere contemplation of sentences written in so picturesque a character as theirs was; but which had doubtless a deeper foundation in the religious sentiments of the people, and their strong feeling of respect for the past.

In hieroglyphic inscriptions the character was sometimes very minute, at others of considerable size, according to circumstances. Of the small picture-writing occasionally employed in sculpture, specimens may be seen in the Rosetta Stone (No. 24);

in some of the smaller sculptures in the same saloon; and also on various of the little scarabæi, the figures of divinities, &c. deposited in the Egyptian Room above. On some of these the carving is exceedingly minute. In such cases the engraving is usually in what artists call *intaglio*—that is, the letters or figures are cut into the stone to a greater or less depth, each line forming a groove, and each little carved space a hollow. How neatly the Egyptians executed even the minutest inscriptions of this kind, an inspection of any of the specimens referred to will prove. The carving on the Rosetta Stone, indeed, is probably not so good as that on some other objects in the museum; but even on it one admires the sharpness with which, in so hard a material as the black basalt of which it is composed, the figures are cut so as even now to be as distinct as when freshly chiselled. But it is in another respect than as a specimen of Egyptian carving that the Rosetta Stone will interest the visitor. It was from this stone that our countryman, Dr Young, derived those first hints as to the phonetic use made by the Egyptians of their hieroglyphics, which, followed up by Champollion and others, have led already to the deciphering of parts of so many hieroglyphic inscriptions, and which may possibly be yet extended so as to enable us to decipher hundreds more. The stone, which is one of the objects surrendered to the British in 1801 on the capitulation of Alexandria, was found by the French among some ruins near the Rosetta mouth of the Nile. It has suffered considerable mutilation, chiefly at the top and on the right side, and now presents the appearance of a black uneven block about 3 feet long, 2½ feet wide, and 10 or 12 inches deep. The smooth polished side, which is uppermost, contains three distinct inscriptions, or rather parts of them: the first, or uppermost inscription, being in hieroglyphics; the middle one in the Enchorial character, employed for common purposes by the Egyptians; and the lowest one in Greek. The least perfect of the inscriptions is the first, of which a considerable portion has been broken off. The three, if not literally translations of each other, are at least to the same import; it having been a not uncommon practice in countries where different languages were spoken thus to repeat inscriptions on public monuments. This is distinctly stated in the Greek inscription, from which also antiquarians have learnt the history of the stone. It was erected, the text says, by the order of the high priests assembled at Memphis on the occasion of the investiture of Ptolemy Epiphanes with the royal dignity (about B.C. 193); and it celebrates the pious and liberal acts of that prince during his minority—that is, from his

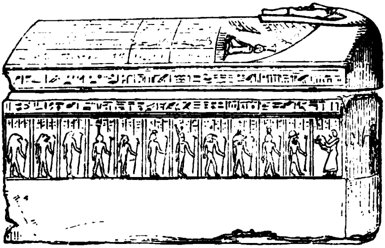


formal accession to the throne on his father's death twelve years before. The stone was probably placed in a temple that once stood on the spot where it was found. Knowing that the three inscriptions were identical, or nearly so in meaning, antiquaries long entertained the belief that the stone might afford a key to the hieroglyphic system of the Egyptians; but it was not till the year 1819 that the notion was verified. In that year Dr Young published his discovery, that a particular group of signs occurring several times in the hieroglyphic text, in each case with a ring or cartouche round them, as if to separate them from the rest, corresponded with a similarly-recurring group of signs in the Enchorial text, which again corresponded with the recurring proper name *Ptolemaios* or Ptolemy in the Greek. Now, as it was evident that in this case the hieroglyphic signs could only be used alphabetically or phonetically—that is, to represent the sounds that go to make up the word *Ptolemaios*—Dr Young was able to determine which sign of the group corresponded with each of these sounds. The same method being applied to the investigation of other groups of hieroglyphics surrounded by rings or cartouches, it was found that other proper names could in a similar manner be deciphered—in other words, that the Egyptians occasionally used their hieroglyphics phonetically, precisely as we do the letters of our alphabet. More recent inquiries have established the phonetic value of a large number of hieroglyphics, and have even discovered the principle on which the Egyptians proceeded in the phonetic use of hieroglyphics—namely, to make each hieroglyphic stand for the initial sound of its own spoken name, just as if we were to make the figure of a *bird* stand for the letter *B*. (See p. 79.)

We have mentioned that, in carving small figures, the Egyptians employed the style called *intaglio* by artists. When, however, the figures, whether in hieroglyphic inscriptions or in ordinary representative sculptures, exceeded a certain size, they carved not in *intaglio*, but in the style called by artists *intaglio-rilevato*, and sometimes also *cavo-rilevo*. In this kind of carving the outline of the figure is first cut in *intaglio* to a greater or less depth as may be thought suitable; and then the portion of stone enclosed in the outline is chiselled in relief, the highest parts in the centre being left nearly on a level with the surrounding stone. This was the favourite style of carving with the Egyptians; it was admirably adapted for their purposes; and in the practice of it they rose to a freedom and a boldness which they did not attain in any other kind of sculpture. The walls of their temples were covered with such carvings, whether in the form of hieroglyphic inscriptions, pleasing to the eye as well as informing to the mind, or in that of scenes and sketches from military, religious, and domestic life. Wilkinson and other travellers speak in high terms of the spirit and vigour shown in some such decorations, particularly in those on the walls of the great temple of Carnak or Thebes. There, on the hard granite, are to be seen ancient Egyptian battle-pieces, sculptured at least 2500 years ago, and yet as fresh and perfect as when the kings were alive whose exploits they celebrated!

Such wall or rock-carvings can of course be judged of in this country only from engravings or plaster-casts; but in the museum there are abundant original examples of the same characteristic style of carving applied to more portable objects. The different classes of such objects may be enumerated thus:—*sarcophagi*, *sepulchral tablets*, and architectural fragments or monuments, such as *columns* and *obelisks*. There are other miscellaneous objects, indeed, not to speak of the isolated statues, on which such carving in intaglio-rilevato may be seen; in fact it was employed wherever sculptural decoration was permissible at all; but the four classes of objects above-named are the most conspicuous.

In the museum there are eleven stone sarcophagi complete or nearly so. These are Nos. 2, 3, 10, 17, 18, 23, 32, 33, 39, 47, and 86. The sarcophagus, as is well known, was the outer stone coffin in which the mummies of deceased personages of rank (whose families alone could afford the expense of such an addition to the ordinary funeral furniture) were deposited after a certain time in order to be laid in the tomb. It consisted of two parts—a chest or case open at the top, and a heavy lid or cover to close over it. In some of the sarcophagi above enumerated (as in Nos. 10, 23, and 86) the cover is wanting; others are complete. The sarcophagus was usually of plain massive shape itself, the decorations consisting simply of the superficial carvings made on it without and within; but some sarcophagi were made in the shape of the mummies to be deposited in them, with the figure of a human face, &c. sculptured on the outside. These (of which Nos. 2, 17, 33, 39, and 47 are examples) were probably the substitutes employed by the rich for the ordinary wooden mummy-cases, and were intended to be placed upright in the tombs; the more massive sarcophagi (Nos. 3, 10, 18, 23, 32, and 86) *contained* mummy-cases, and lay horizontally on the floor of the tombs. Of these perhaps the finest in the museum is No. 10, which was discovered by the French in the mosque of St Athanasius at Alexandria, where it was an object of veneration to the Mussulmans, who used it as a reservoir for water, and had bored holes in it for that purpose. It was surrendered to the British, with other objects in the museum, in 1801. The material is a *breccia* (an Italian word used by mineralogists to designate rocks composed of angular fragments of pre-existing rocks cemented together), the constituents of which are fragments of granite and brilliant porphyry, with deep-green rock serving as a basis. The dimensions are—length, 10 feet 3 inches; breadth at the head, 5 feet 4 inches; at the feet, 4 feet 2 inches; depth, 3 feet 9 inches; thickness of the walls at the top, about 10 inches. Although the material must have been most difficult to work, the sarcophagus is covered, both outside and inside, with neat hieroglyphics, some of them extremely small, as well as with figures of men and animals, some of them beautifully executed. The entire number of characters engraved on it is said to exceed 21,700. Dr Clarke tried to prove that this sarcophagus must have contained the body of Alexander the Great, who, it is known, died and was buried at Alexandria (B.C. 323); but from the inscriptions, it has been ascertained that the occupant of the chest was not the Macedonian conqueror, but a much more insignificant person, Hernecht-hebi or Amyrtæus, a Pharaoh of the twenty-eighth dynasty, whose reign, though subsequent to the Persian conquest, was considerably anterior to the time of Alexander. Another very fine sarcophagus is No. 3, which was presented to the museum in 1839. It enclosed the body of Saatu or Nesatu, a priest of Memphis; and was found in a tomb of the period of the twenty-sixth dynasty (B.C. 650-525), at Gizeh, near Cairo, and not far from the ruins of the great city where the priest once officiated. No. 18, which is of syenite, is the sarcophagus of Paneter-hent, once a bold standard-bearer in the Egyptian army. No. 23 is the chest of a large black granite sarcophagus that contained the mummy of Hapimen, a royal scribe; it is elaborately carved with names, symbolic figures of deities, &c. and religious sentences, and was brought from Cairo, where the Turks used it as a cistern, and called it 'the Lover's Fountain.' It has not been positively ascertained who was the inmate of No. 32, but among the names carved on it is that of the queen of Amasis, of the twenty-sixth dynasty, for whom, accordingly, it is supposed to have been made. It was discovered near Thebes in an excavation 130 feet deep. No. 86 is of black basalt; it is the chest of the sarcophagus of Hanata Ranem-hatnem, a priest of the twenty-sixth dynasty, and a contemporary of Amasis. Should the visitor have any curiosity to know what was the personal appearance of this unknown Hanata Ranem-hatnem, let him look at the small black basalt statue, No. 134, in the same saloon, which is a likeness of that individual (unfortunately, however, with the head broken off), and which was presented to the museum in 1771. Various other instances have occurred in which interesting connections have been found out between Egyptian relics discovered at different times and in different places. Of the mummy-shaped sarcophagi, one of the finest is No. 2, which is of arragonite, and was found at Thebes; the face was once gilt, and is probably a portrait of the occupant, a bard named Pctenesi, of the twenty-sixth dynasty. No. 17 was occupied by the mummy of Seveski, a priest of one of the later dynasties; No. 33 is of green basalt, and contained the mummy of a female named Anch; No. 39, which was presented by the Earl of Belmore in 1820, is of limestone; No. 47, which is unfinished, is also of limestone. Among the most beautiful sarcophagi ever discovered was one of fine translucent arragonite, resembling alabaster, and elaborately carved, which was found by Belzoni in a splendid tomb, which he was the first to explore, in that part of Egypt called Beban el Molouk, or the Valley of the Tombs of the Kings. It was sold by Mr Salt, Belzoni's patron, to Sir John Soane for £2000, and is 9 feet 5 inches long, 3 feet 7 inches wide, and 2 inches thick.


Sarcophagus, No. 2.

A very large proportion of the antiquities in the saloon consists of what are called in the catalogue 'Sepulchral Tablets.' These tablets have all been brought from Egyptian tombs, the subterranean walls of which they once adorned, each tablet having been erected to the memory of some occupant of the tomb whose body lay near. The effect, in fact, of such a collection of Egyptian sepulchral tablets ranged round the walls of an apartment in a modern museum, is as if some thousands of years hence an antiquary were to make a collection of head-stones from European churchyards illustrative of the manners of the nations that once inhabited Europe; with this exception, however, that the ancient Egyptian tablets have been finished with more comparative care, and are, upon the whole, far more valuable as historical records, than modern tombstones would be. Small as most of them are, they usually contain not only an epitaph commemorating the name of the deceased, his age, office, and other particulars regarding him, but also certain religious formulæ taken from the Egyptian ritual; and on almost all of them are sculptured, with more or less art, some scene or group of figures illustrative either of Egyptian mythology or of ordinary Egyptian life. Among the tablets in the saloon, some are of extremely ancient date, reaching back to the times of the first Pharaohs; others are comparatively modern, having been executed in the times of the Ptolemies; or later still, when Egypt was a Roman province. Among the most ancient is No. 212, which was erected to the memory of Heb-hai, a high officer of state of Neper-cheres, a Pharaoh of the fifth dynasty—a period which cannot be determined with certainty, but which is believed to have been anterior to the time of Abraham. No. 128 is also of very ancient date; it is of calcareous stone, and contains a dedication to the gods Osiris and Anubis, and a representation of the deceased—a scribe by profession—receiving the adorations of his family. Of later date are No. 101—which is the tablet of Neb-pu-user-te-sen, a functionary in the reigns of Usertesen III. and Amen-em-ha III., Pharaohs of the twelfth dynasty (still anterior to Abraham)—and Nos. 143, 256, 257, and 258, which are of the same dynasty. There are various tablets of the time of Rameses the Great (eighteenth dynasty), as No. 161, which contains the epitaphs of Rashpu and Amenmes, two royal scribes; and Nos. 163, 164, and 167, which are also the tombstones of royal scribes. All these, and indeed the greater proportion of the tablets in the collection, are from the tombs of Thebes. To the Græco-Egyptian period belongs No. 147, a tablet dedicated to Osiris, Ises, and other gods, for a female named Tai-em-hept, who, as the inscription informs us, was born in the tenth year of the reign of Ptolemy, surnamed Neos Dionysos or Auletes (B.C. 71); was, in the twenty-third year of the reign of the same Ptolemy (that is, in B.C. 58, when she can have been but thirteen years of age), married to Pet-bast, a priest holding several priesthoods—or, as we would now say, several lucrative livings—this priest being the son of an officer named Ensa-ati and a lady named Her-anch; on the 15th of the month of Epiphi, in the sixth year of the reign of Cleopatra (B.C. 45, when she was twenty-six years of age), gave birth to her son Imouth (probably the person who erected the tablet); and four years after, on the 18th of Tybi, in the tenth year of Cleopatra (B.C. 41), was buried. Such are the little family histories that many of these tombstones contain. Possibly the 'Pet-pecht, surnamed I-em-hept or Imouthos, and holding many priesthoods,' for whom the tablet No. 188 was erected, is the identical Imouth mentioned in the foregoing; for the Enchorial inscription on the tombstone seems to commence with the sixth year of Cleopatra, the exact year in which the foregoing Imouth was born. Among other interesting epitaphs are that on the tablet No. 378, erected to the memory of Haru, a priest and scribe holding numerous priesthoods in the reigns of Ptolemy Soter and Ptolemy Philopater; that on tablet 387, to the memory of Tai-em-hept, a priestess of Phtha, who, after living thirty-six years, 'received funeral ceremonies for thirty-six days, and an embalment of seventy days;' and that on tablet No. 393, which was erected to the memory of an Egyptian named An-em-her, whose profession is not mentioned, but who died, the inscription bears, in the thirty-sixth year of one of the Ptolemies, at the age of eighty-two years. Among the tablets of the Roman era are Nos. 395, 398, 399, 400, 401, &c. Later still are such tablets as No. 406, which bears a Greek inscription, and was erected to Marcus, a Christian of Egypt, who died in the 262d year of the Diocletian era (A.D. 545-546); and No. 408, a similar tablet of the same era to Peter, a deacon of the Christian church. What a lapse of time is thus represented in this collection of Egyptian sepulchral tablets! Between the date, for example, of the carving of such tablets as that to Heb-hai, the priest of the fifth dynasty of Pharaohs, and that of the carving of the tablet to Peter the Christian deacon, the interval was upwards of 2500 years—about double the interval that has elapsed between the death of the said Peter and the present hour.

The tablets differ from each other in material, size, style of carving, &c.; and on some the sculptures are much more numerous than on others. On looking at so many head-stones all elaborately carved with hieroglyphics, portraits, processions, and domestic scenes in which so many familiar and professional objects are represented (jars, furniture, flowers, fruits, geese, and other viands; cattle, agricultural implements, weaving implements, &c.), one's first impression is that of respect for the pious punctuality which thus induced the Egyptian families to commemorate, by appropriate epitaphs after death, the special characters and occupation of their deceased members. This impression, however, must be considerably qualified. These sepulchral tablets were not carved to order, and with strict attention in each case to the real circumstances and manner of life of the deceased. On the contrary, a supply of tablets was always kept on hand by the priests, already sculptured with scenes, religious formulæ, &c. but with blank spaces left, where the name, age, date, &c. might be afterwards inserted; and when a death took place in a family, the survivors had only to choose out of the stock the particular tablet whose pattern, &c. they preferred, and the necessary alterations were made in it against the day of funeral. In some cases a person might select and purchase his own head-stone before death. Hence the figures representing the deceased on the tablets are by no means necessarily portraits; nor do the scenes indicate the profession of the deceased. Hence also a sameness in the tablets where the same formulas and scenes recur, just as in the inscriptions on modern tombstones the words, 'sacred to the memory,' and such-like, are repeated. Sometimes, doubtless, a head-stone was executed more or less according to order, and then care may have been taken to make the design more characteristic and appropriate. For example, in No. 297, one of the wives of the deceased is painted black, probably to indicate that she was a negress. Possibly the tablet No. 579 may be of this kind. It is 'dedicated to Osiris, Anubes, and the gods of Abydos for User-ur, a sculptor, who is seated on a chair with his wife, Neter-tep, before a table of offerings, on the other side of which is another wife, Amenu; on the other side are the father and mother and brother of the deceased; below are his son and five daughters, his father and brother standing; the tablet is unfinished, and is remarkable for the squared network or canon traced in red upon it for the guidance of the sculptor.' May we not suppose that this tablet was carved by User-ur, the sculptor himself, in his leisure hours during the last year of his life; and that, after his death, his family, with a pious fancy, erected it unfinished as it was?

To be distinguished from the Sepulchral Tablets, with which they are arranged, are various tablets of similar appearance erected to commemorate public acts, &c. Such are No. 135, a large slab of dark basalt, 'on which is recorded the distribution of certain paintings made in the temple of Phtha by the monarch Nepercheres, whose name has been purposely erased throughout the inscription;' No. 138, a calcareous stone tablet, 'with an inscription in hieratic character, being a public act dated the 6th of the month Choiak, the 31st year of Amenophis III. (about B.C. 1430),' &c. By far the most important tablet, however, in the collection, is the carved and painted one called the 'Tablet of Abydos,' which is conspicuously placed (No. 117) on the middle of the wall on one of the longer sides of the saloon. This celebrated monument, which is of calcareous stone, was discovered in 1818 by Mr W. Bankes on the wall of an ancient temple among the remains of Abydos, a former city of Upper Egypt. It represented an offering made by the great King Rameses II. to the souls of his predecessors. When complete, it consisted of three divisions or compartments, one above another, each compartment being divided into twenty-six rectangular spaces, making seventy-eight rectangular spaces in the whole tablet. Each rectangular space contained the name of a king in hieroglyphic signs, surrounded by an oval or cartouche, like the name *Ptolemy* in the Rosetta Stone. The fifty-two rectangular spaces of the two upper compartments contained the names of fifty-two Pharaohs, the predecessors of Rameses, while the name and titles of Rameses himself, repeated twenty-six times, filled, it is supposed, all the spaces of the lowest compartment. Of this lowest compartment, however, only nineteen of the rectangles remain, nor are the other compartments complete. The tablet, as may be conceived, is of the utmost value in determining the chronology of ancient Egypt; and for this reason it has been copied in all the great works on Egyptian antiquities. It is uncertain, however, on what principle the list of the predecessors of Rameses that it contains was drawn up; and whether the fifty-two personages whose names occupy the first fifty-two rectangles were entered as his historical or merely as his genealogical predecessors. The names in the first compartment are of kings anterior to the twelfth; the second compartment contains names from the twelfth to the eighteenth dynasty. On the right of the tablet probably stood a figure of Rameses, and on the left may yet be seen the lower part of a figure of Osiris.

Passing from the tablets, whether sepulchral or memorial, to what are more properly architectural fragments, the visitor will find scattered throughout the saloon various portions of tombs, temples, &c. (Nos. 157, 160, 444, 445, 454, 535, &c. &c.). A few portions of columns are also to be seen. Thus No. 59 is a fragment of a column of porphyry, a stone which does not appear to have been worked in Egypt before the first century of our era; and No. 64 is a complete column in four pieces, carved with inscriptions, and having a capital in the shape of the buds of the lotus. This column was found in a house at Cairo, and probably belongs to the period of the twentieth dynasty.

After the Pyramids, the obelisks are the class of Egyptian monuments best known by name. 'An obelisk,' says Professor Long, 'is properly a single block of stone cut into a quadrilateral form. The horizontal width of each side diminishes gradually, but almost imperceptibly, from the base to the top of the shaft, which is crowned by a small pyramid, consisting, as usual, of four triangular sides meeting in a point. Most obelisks of which any accurate dimensions have been given have only the opposite pairs of sides equal, one pair often exceeding the other in the horizontal breadth by six or seven inches, or even by more than a foot. Obelisks were sometimes of small dimensions, and in that case were of sandstone or basalt; but the larger obelisks are all made of the red granite of Syene, from which place they were transported to the most distant parts of Egypt. It would appear that obelisks were chiefly used in pairs, and placed on each side of the *propyla*, or great entrance to a temple. But they were also placed occasionally in the interior of a temple, but still in front of gateways, as at Carnak. An obelisk of large dimensions is exceedingly well calculated to produce an imposing effect. Rising from its base in one continuous unbroken line, the eye, as it measures its height, meets with no interruption; while the absence of all small lines of division allows the mind to be fully impressed with the colossal unity of the mass. Its diminishing bulk also, as it rises from the base, takes away all appearance of heaviness; and the quadrilateral pyramidal top forms a more pleasing termination than any other figure could give. Were an obelisk half the height of the London Monument placed by its side, it would produce a much stronger impression, owing to the superior advantages of its shape.' In the museum, placed not in the saloon, but in the lobby exterior to it, as one ascends the staircase to the Egyptian Room, are two obelisks of small size that were brought from Cairo, where they were seen by the traveller Niebuhr, the father of the historian; one of them then serving as the door-sill of a mosque. The pair, which are of the same material—namely, dark-green basalt—and of the same size, probably stood together at the propyla of the same temple. Both have been somewhat injured at the top and edges; one has been broken into two pieces, and reunited. The dimensions of this one at present are as follow:—height, 8 feet 1¾ inches; width of one of the sides (as well as of its opposite side) at the base, 1 foot 5½ inches; of the other side (and of that opposite to it), 1 foot 4⅞ inches; width of the greater side, taken at a height of 4½ feet, 1 foot 2⅝ inches. All the four faces are sculptured with hieroglyphics, which are contained between lines running up the faces, and leaving a vacant margin towards the edges. The hieroglyphics on the opposite sides are nearly, but not quite the same, but differ in the two pairs of sides. The execution of the figures on these obelisks has been very much admired; particularly that of the birds, in the delineation of which class of animals the Egyptian sculptors appear to have attained peculiar excellence. The inspection, however, of such small obelisks can hardly convey any idea of the effect of the larger granite monuments of the same shape, which seem to have been in such favour with ancient Egyptian architects. Some of these were 50 or 60 feet high; the obelisk of Alexandria is 63 feet high, and 8 feet wide at the base. Even these large obelisks were elaborately sculptured to the very top; and it shows the extreme punctuality of the Egyptian artists, and the mechanical strictness of the rule according to which they worked, that even the figures that were at such a height as not to be seen at all, or at least seen very imperfectly, were finished as carefully as those that would be most ex-

posed to notice. It must be a matter of curiosity to all how such immense single blocks of granite as those of which the larger obelisks have been formed, could be detached from their native quarries. A comparison with the practice of the modern Hindoos throws some light on this as well as on other points of Egyptian archæology. 'In the granite quarries near Seringapatam,' says Sir John Herschel, 'the most enormous blocks are separated from the solid rock by the following neat and simple process:—The workman having found a portion of the rock sufficiently extensive, and situated near the edge of the part already quarried, lays bare the upper surface, and marks on it a line in the direction of the intended separation; along which a groove is cut with a chisel about a couple of inches in depth. Above this groove a narrow line of fire is then kindled, and maintained till the rock below is thoroughly heated, immediately on which a line of men and women, each provided with a potful of cold water, suddenly sweep off the ashes, and pour the water into the heated groove, when the rock at once splits with a clear fracture. Square blocks of 6 feet in the side, and upwards of 80 feet in length, are sometimes detached by this method.' By similar processes also the blocks for building purposes, &c. must have been detached.

The intaglio-rilevato carvings on all the classes of objects that we have been describing, but particularly those on the walls of temples and tombs, were frequently coloured, to increase the richness of the effect; and indeed, as has been already stated in a previous part of this volume, Egyptian painting was little else than this very art of placing a coating of colours on a surface of stone already carved in intaglio-rilevato to receive it. The combination of colours with sculpture appears to have been more agreeable to Egyptian than it is to modern taste; and of the appearance of the interior of an Egyptian temple with its walls, roof, and columns all niched, carved, and variegated with blue, red, green, &c. it is somewhat difficult for a modern who has not actually seen such a spectacle to form a just conception. Special descriptions of some of the paintings in the Egyptian Saloon have been given under the general head of Egyptian Antiquities; but a great proportion of the objects that we have just been describing as sculptures, are in reality also paintings. The tablet of Abydos, as we have mentioned, is a coloured sculpture, and so are many of the finest of the sepulchral tablets.

Besides the *intaglio* and the *intaglio-rilevato* styles of sculpture, the Egyptians practised that of *bas-relief*, properly so called, both in that ancient form to which reference has been made, in which the object represented was made to stand out in a deep hollow niche sunk below the general surface, and in the more common form in which the figure simply projects *from* the general surface. Not a few of the sepulchral tablets, and those among the most ancient, are executed in bas-relief. Thus in one (No. 159) there is a representation in bas-relief of the deceased, a priest named Rutkar, seated with his wife 'viewing various domestic operations, such as the milking of cows, and receiving the offerings of his family.' Still finer in point of execution is No. 282, on which in one compartment is 'Pah-mehti, a door-keeper of the northern reservoirs or tanks at Thebes, worshipping Osiris and Anubis;' in another is the same Pah-mehti seated with his wife, and holding a lotus flower, while his two sons adore him; and in a third is one of the sons making offerings to certain gods. Perhaps the most elegantly-carved tablet in this style, however, is a coloured one (No. 587) in memory of Amenha, a superintendent of the palace. Among the bas-reliefs of larger size and more conspicuous appearance may be mentioned a slab of basalt, apparently the cover of a sarcophagus (No. 90) of the times of the Ptolemies, on which is sculptured the full-length figure of a man in Græco-Egyptian dress, not unlike the sculptured knights that are to be seen reposing in the aisles of Gothic churches. The covers of some of the mummy-shaped sarcophagi already noticed may also be regarded as examples of Egyptian bas-relief. But the most remarkable specimen of such sculpture in the museum is a massive monument of syenite (No. 12), found amidst the ruins of Carnak, standing on a pedestal of white stone in an angle of the wall enclosing the great temple. This monument is of an oblong shape, with two broad and two narrow sides: on each of the broad sides is a figure in very high relief of Thothmes III. of the eighteenth dynasty (B. C. 1491), holding with one hand a figure of the deity Munt-ra, which also occupies the broad side, and with the other hand a figure of the goddess Athor, which occupies each of the narrow sides. The figures of the deities are in lower relief than that of the king, and appear to have been substituted for other figures which previously occupied their places. What was meant to be represented by this curious monument it is difficult to surmise; it derives a special interest, however, from the fact, that the Thothmes whose figure appears on it is believed to have been the Pharaoh in whose reign the exodus of the Israelites took place.

From the contemplation of these high bas-reliefs, we pass naturally to the detached sculptures, which, from their size and position, form the most attractive objects in the saloon. Omitting various miscellaneous objects—as basins and other vessels of basalt and of sandstone, and the sepulchral vases and altars already noticed in a previous part of this volume, and of which there are many additional specimens in the saloon—we may arrange all the conspicuous sculptures of this class under two heads: 1*st*, Statues or parts of statues, in the human form, whether colossal or of small size; and 2*d*, Sphinxes, and other animal forms.

We have already mentioned that all the genuine Egyptian statues seem to have been first sculptured in deep relief, and then detached from the parent rock, with a portion of it still adhering to them at the back, as if to attest their origin. This adhering portion of rock the Egyptian statues never, if we may so speak, shook off; they never rose free-limbed and buoyant like the products of the Greek chisel, starting from the stone. A stiff figure, rock-bound, and enduring for ages—such was the Egyptian idea of a statue; and whatever may have been the cause of the fact, whether the positive enactments of the priests chaining down the efforts of artists, or, as is more probable, the inherent preference of the national mind for this peculiar kind of ideal, Egyptian statuary restricted itself wholly to the production of such rock-bound and enduring figures. The attitudes, the expression, &c. all conformed to the primary conception. Heaviness, calmness, repose, and a few simple attitudes, such as would beseem the majesty of a stony colossus to be seen in the stillness of night—these were all that was required, and these the sculptor studied. 'The general characteristics of Egyptian sculpture,' says a writer on this subject, 'are extreme simplicity or uniformity in the composition of the lines, want of variety of action, and the absence of sentiment or expression in the heads. Their statues are standing quite upright, or sitting with all their limbs at right angles to the body, or kneeling on both knees; the arms are generally attached to the body, the hands close to the thighs—though in female figures one hand is frequently placed across the breast; in the kneeling figures the hands are brought a little forward on the front of the thighs, and support a box containing idols; the feet are for the most part parallel, and joined together, though this is not always the case, for in standing figures one foot is sometimes slightly advanced before the other. The statues of men are entirely naked, excepting that a sort of apron is folded across the loins; those of females are dressed in one long and simple garment fitted close to the body; there are no folds in it, and it is only to be distinguished from the figure by a slightly-raised border at the neck and feet. It has been remarked, and with great justice, that the Egyptians appear to have paid greater regard to decency, and to have preserved more modesty in their figures, than any other people who have practised the arts. The heads, when they are human, are sometimes uncovered, but more frequently they are surmounted either by an emblematical head-dress, in which is distinguished the lotus, a globe, a serpent, or some other sacred symbol; or that more generally found in representations of the human figure in Egypt, consisting of a sort of close cap or head-piece, entirely concealing the hair, and falling in broad flaps upon the shoulders. . . . . The form of the face is rather short or round; the eye, large and pointed at the extremities, has a slight inclination upwards at the outer corner; it is not sunk into the head, as is observable in Greek sculptures, but projects as far forward as the brow, which is merely indicated by a slightly-raised line or sharp edge: the nose is much rounded at the point, somewhat flattened, and rather wide at the nostrils; the projection of the cheek-bones is considerably marked, but with great roundness, and this it is which gives the fulness to the upper part of the face; the character of the mouth is peculiar; the lips are heavy and thick, and slightly turned up at the corners, casting a simpering or silly expression over the countenance; the mouth, too, is always represented closed, differing in this respect from the early works of Greece and other countries, where we find the mouth generally, if not always, slightly opened; the chin is rather small, and without that projection which gives so much beauty to the face, especially in the profile view of it: in the placing of the ear there is a remarkable peculiarity, it being situated so high up, that in many instances the lobe or lower part of it ranges nearly in a line with the eyes. The hands and feet are long and flat; the nails are rudely marked, but there are no indications of knuckles or joints; the toes are rather long, and the smallest one, instead of being turned or bent as in Greek statues, is extended like the others. It has been observed in some standing statues that the feet are not of equal length: one is generally a little advanced before the other; the hinder, on which the figure rests, is made the longest. The navel in figures of both sexes is strongly marked.'*

Egyptian statues were made of all sizes—colossal, of the size of life, or in miniature. The colossal statues appear, however, to have been those in which the Egyptians delighted most; and it is in them that we see most distinctly the characteristics of the national statuary. Such statues were frequently placed in pairs, like the obelisks at the propyla or grand entrance to a temple; occasionally, however, they were placed in isolated positions, as in the court of some great temple. Colossal statues abounded in Thebes, where their remains are still to be seen. One of enormous size stood in the court of the temple at that place, called the Memnonium. It was a syenite statue of the great national hero,

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* Art. *Sculpture*, 'Encyclopædia Metropolitana.'

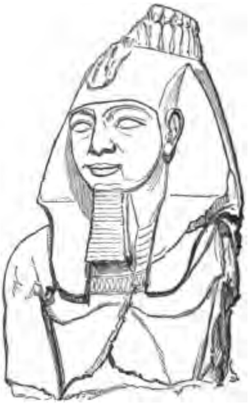
Rameses II., seated on a throne in the usual attitude of tranquil repose. This statue, which must have been wilfully destroyed, and of which only the shivered fragments are now to be seen, is calculated to have weighed 887 tons—a mass equal to three times the solid contents of the largest obelisk yet discovered. The largest colossi now existing are four huge sitting figures in front of the rock-temple of Ibsamboul or Abousambel in Nubia. These were brought into notice by Belzoni, by whom the rock-temple itself was first explored in 1817. Two only are in sight, a third and fourth being yet buried. Of one of those exposed, the dimensions are as follow:—total height of the sitting figure 50 feet, exclusive of the cap, which is 14 feet high; breadth across the shoulders, 25 feet 4 inches; length of the face, 7 feet; of the nose, 2 feet 8 inches; of the beard, 5 feet 6 inches. Of the face of this colossus, which also represents Rameses II., there is a plaster cast in the museum, placed high up on the southern wall of the Central Saloon, fronting the Egyptian Saloon. Many such colossi, measuring from 40 to 60 feet high, appear to have been erected in commemoration of the same monarch. Herodotus mentions two colossi existing in his time, each 75 feet high, the one at Memphis, the other at Sais.

When we consider the immense size of those statues—the hardness of the material of which many of them were made—basalt, breccia, or, most frequently of all, the beautiful red granite of the country; and lastly, the elaborate care with which they were not only chiselled, but polished in every part, and in some cases painted, we shall gain some notion of the amount of toil that must have been expended on such works, and of the wonderful sway that the priestly caste must have exercised over the national industry, to induce it patiently to waste itself in that kind of employment. In return for onions and garlic, and a little Egyptian beer supplied from day to day, myriads of men spent their lives without a murmur in shaping and polishing a block of granite, and then setting it up in the court of some temple, according to the instructions of their superiors! A few years spent in this single service, and the men died, and were forgotten! Such was the primitive civilisation under which the Egyptians flourished! How different from that which now prevails in Europe, under which, to expend labour on that which, when finished, would be no addition to the working capital of the country, would be accounted a folly. For onions and garlic, indeed, supplied from day to day, multitudes would still cheerfully lend their services to any kind of work whatever; but sound opinion now demands that the works shall always be of such a kind that, when finished, they will stimulate farther production for the sake of future workmen. There is of course an exception in favour of works of art, which exist in virtue of a higher law—that of a necessary craving of human nature. And this exception must apply in part to those colossal sculptures of the Egyptians, the men engaged on which saw them through the medium of other feelings than those with which we are able to regard them. Yet how great must have been the resources of the country in proportion to the population, to sustain so vast an amount of unproductive labour, even under the name of art!

Nor, if the sculptures of Egypt are wonderful in a social, are they less wonderful in a mechanical point of view. By what tools were those granite statues chiselled, six or seven blows against which turn the edge of the finest modern tools, and render them perfectly useless? How were they polished? How were such enormous masses of stone transported from the quarries where they were sculptured and dressed? That the granite was cut by bronze chisels worked with a mallet there is no doubt; hence, as has been stated in a previous part of the volume, we are obliged to conclude that the Egyptians possessed secrets in the art of tempering bronze, so as to render it better for cutting granite with than the finest steel. As to the method of working, we derive some information from the practice of the Hindoo sculptors in cutting granite. 'The tools which the Hindoos use,' says Professor Long, 'are a small steel chisel and an iron mallet. The chisel is not more than about twice the breadth of the hand of the Hindoo workman, which, as is well known, is very small, and it tapers to a round point like a drawing pencil. The mallet is a little longer than the chisel, but does not weigh more than a few pounds. It has a head fixed on at right angles to the handle, with only one striking face, which is formed into a tolerably deep hollow, and lined with lead. With these two instruments only, the stone is brought to a smooth surface; it is next dressed with water in the usual way; and finally, it receives the shining polish in the following manner:—a block of granite of considerable size is rudely fashioned into the shape of the end of a large pestle. The lower face of this is hollowed out into a cavity, and this is filled with a mass composed of pounded corundum stone (emery powder) mixed with melted bees' wax. This block is moved by means of two sticks, and its whole weight is such as two workmen can easily manage. They seat themselves upon or close to the stone they are to polish, and moving the block backwards and forwards between them, the polish is given by the friction of the mass of wax and corundum.' The processes of the Egyptian sculptors, who, it is known, used emery powder, were in all probability similar to those here described; and when the statue was complete, it was transported by means of a low carriage moving on rollers, and drawn by thousands of workmen.

One of the tomb-paintings described by Wilkinson represents the transportation in this way of a colossal statue.

Of the original statues, or portions of statues contained in the museum, it will be sufficient to describe one or two of the most remarkable. And first, of the finest specimen in the whole collection, if not, indeed, the finest specimen of Egyptian sculpture in the world—the so-called 'Head of the Young Memnon' (No. 19), more properly termed the head of Rameses II. or III. (it being doubtful whether the great Egyptian monarch, the Sesostris of Herodotus, was the second or third Pharaoh of his name), from the Memnonium of Thebes.

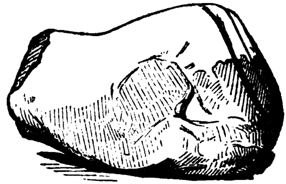


No. 19.

The origin of the name *Memnon* has not been satisfactorily determined. It was used by the Greek writers from Homer downwards to designate a legendary hero and conqueror of ancient Egypt, whose fame had travelled into Europe, and to whom popular tradition assigned a part in the great Trojan war. The conjecture might be, that this hero can have been no other than Rameses, of whom alone of all the Pharaohs was the fame likely to become embodied in Greek legends. The name Memnon, however, is with more probability identified with that of Amenophis III., a Pharaoh of the eighteenth dynasty, who lived about B.C. 1430. At all events, when the Greeks were admitted into Egypt, they seem to have applied the name of Memnon indiscriminately to various colossal statues that were to be seen in that country. Thus the colossal Theban statue mentioned above as having weighed 887 tons was a Memnon, and the temple which it and other Memnons adorned was called the Memnonium. Another celebrated statue of the same kind was the 'vocal Memnon,' described by the Greek authors Strabo and Pausanias, and which derived its name from the strange sound—resembling the snapping of a harp-string, according to one description; the sound of brass when struck, according to another—that was said to proceed from it at sunrise.. This vocal Memnon was one of the wonders of Egypt, and all distinguished persons who visited Egypt went to hear the sound which it emitted. Strabo heard it himself; various of the Roman emperors were reported to have heard it; and, in short, the weight of evidence was such as to establish beyond a doubt the fact that a sound, however produced, did proceed from the statue at certain hours. A controversy has existed as to which of the colossal statues still existing in Egypt is to be regarded as the true vocal Memnon. Notwithstanding some discrepancies, it has been proved that the true statue is the most northern of two colossi that now stand on the western bank of the Nile near Thebes. This statue is fifty feet high, and in a sitting posture; and its legs are covered with numerous inscriptions in Greek and Latin, commemorating the names of visitors, chiefly of the times of the later Roman emperors, who testify that they heard the sound. Strabo and Pausanias say that in their time the upper part of the statue had fallen down; at present, however, it occupies its proper position, having apparently been restored. On ascending to the lap of the statue, and hiding himself in a cavity made there, Wilkinson found that, by striking a particular portion of the stone between the knees of the statue, a sound was produced which the Arabs at the foot of it declared to resemble the ring from metal—hence he concludes that the sound was a trick of the Egyptian priests. Others, however, seek a natural explanation of the phenomenon, in the escape at certain times of confined air from the pores of the stone. Humboldt saw certain rocks on the banks of the Orinoco from which similar sounds are heard to proceed at sunrise.

With this vocal Memnon the young Memnon of the museum is not to be confounded. This monument, which consists of a head with a portion of the attached bust, is formed of a single block of fine syene granite, one piece of which is red, while the rest is blue or grayish. The sculptor, with admirable taste, used the red part for the head, and the darker part for the breast, and possibly also for the rest of the body. When complete, the statue, which was in a sitting posture, may have been about 24 feet in height; the height of the remaining fragment is 8 feet 9 inches. The dimensions are, round the upper part of the shoulders and breast, 15 feet 3 inches; round the lower part, 14 feet 7 inches; height of head and beard, about 6 feet; length of face from the forehead to the chin, 3 feet 9 inches. Although the statue has all the characteristics of Egyptian sculpture already described—the projecting eyes, thick lips, high ears, and small chin—yet such is the beauty of the execution, so much sweetness and mildness is there in the expression of the countenance, that the effect is, on the whole, extremely pleasing. Here, in short, we have the masterpiece of some Egyptian sculptor of superior genius whose name has perished. Here also, if we are to accept the statue as a genuine likeness, we behold the features of the great Egyptian Pharaoh, at whose name, some fourteen centuries before Christ, the Mediterranean nations trembled. Doubtless on such a subject the sculptor would do his best; striving, while transmitting the features of the hero to posterity, to produce also a countenance that would be the ideal of Egyptian beauty. Traces of colour still remain on the bust. The monument, which originally stood in Thebes, and which long attracted the notice of travellers visiting that once celebrated spot, was removed by the ingenuity of Belzoni in 1817; and having been carried down the Nile in a barge, was brought by sea to London.

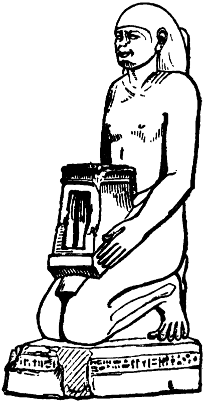
Opposite to this head of Rameses the Great is another colossal head, of somewhat larger size, and also of excellent sculpture (No. 15). This head was found at Carnak, on the east side of the Nile, and must therefore have been one of the multitude of statues that stood in ancient Thebes. It was discovered by Belzoni in 1818, and by him brought to England. The material is red granite, which is beautifully polished. The head, which is crowned with the peculiarly-shaped royal cap or mitre called the *pschent*, is evidently that of a king; and as the features present a strong resemblance to those of Thothmes III., as represented in other statues, the probability is, that here we have the head of that monarch—the identical Pharaoh before whom Moses and Aaron so often presented themselves, and from whom at last they wrung the reluctant promise to let the children of Israel go. The fragment is extremely well preserved, only the left ear and part of the chin and beard being broken off from the head itself, while the pschent is nearly complete. The entire statue to which it belonged, which was a sitting one, must have measured 26 feet in height; the fragment itself gives the following measurements:—from the neck to the top of the mitre, 10 feet; circumference of the neck, 8 feet 4½ inches; length of nose, 11½ inches; width of mouth, 1 foot 1½ inches. In the sand in which this fragment was found was also found the arm of the same colossus. This arm is also in the museum (No. 55), and is altogether a proof that the Egyptian sculptors, if they were ignorant of the internal anatomy of the human body, had paid considerable attention to its external anatomy, and especially to the marking and direction of the muscles. The whole length of the arm is 10 feet; its circumference at the thickest part below the elbow is 5 feet 1 inch; the length from the wrist to the knuckle of the middle finger (the hand being closed) is 17 inches; the length of the long joint of the middle finger is 13½ inches. The material is the same red granite of which the head is composed. Together with this colossal arm may be noticed a colossal fist of red granite (No. 9), brought from the ruins of Memphis, and supposed to have belonged to one of the six gigantic statues described by Herodotus as standing before the temple erected to Hephaistos or Vulcan in that city by Sesostris (Rameses the Great); two of these statues, each 45 feet high, representing Sesostris himself and his wife, and the other four their four sons. The fist measures, from the wrist-joint to the knuckle of the middle finger, 32 inches; from the first to the second knuckle of the middle finger, 26 inches; round the wrist-bone, 80 inches; across the fingers, 30½ inches; across the middle finger, 9 inches. Between the thumb and forefinger are the remains of a cylinder representing a stick or baton.


Colossal Fist.

Smaller than either of the two heads that have been described, but still of colossal dimensions, are the two marked No. 4 and No. 6, both of which were found in an excavation made by Mr Salt in a line with the great statue of the vocal Memnon at Gournah. The two heads, which are exactly alike, and both of which wear a royal cap (whether the pschent or the tesher, cannot be certainly determined from their present condition), probably belonged to colossal statues of Amenophis III. (Memnon), that stood in front of that king's palace at Thebes. The material is a brownish breccia highly crystallised. Of this Pharaoh, whose popularity, if we may judge from the amount of employment that he gave to the sculptors, must have nearly equalled that of Rameses himself, there is in the museum a complete statue (No. 21)—a miniature copy of the great vocal Memnon, but still colossal. The material is black granite; the dimensions are—total height of the seated figure, 9 feet 6½ inches; height of pedestal, 12½ inches; from the sole of the foot to the knee-joint, 3 feet 6 inches; length of the foot, 1 foot 7 inches; length of the extended hand, 1 foot 2 inches. This statue possesses considerable merit; it is most pleasing when looked at in profile. A fault that has been remarked in it, is the disproportionate length of the leg from the ankle to the knee. Not far from this statue stands a colossal foot of large dimensions.

Besides the statues and fragments of statues above mentioned, there are many others of considerable size, and worthy of the notice of the visitor. Some are mere heads, others busts, others torsos, others the lower parts of figures, while some are complete, or nearly so. Among the complete figures some are figures of gods, others statues of Pharaohs and personages of importance in the military or civil history of Egypt. Of all the gods of the Egyptian Pantheon, Pasht, or Bubastis, appears to have been the favourite subject for sculpture. There are numerous Pashts in the museum collection, of different dates and degrees of excellence; some of them standing erect, others seated on a throne. Of the seated Pashts, that marked No. 63 may be taken as a specimen. It is of dark granite, and was brought from Carnak; on the front of the throne are inscribed the name and title of Sheshank I., of the twenty-second dynasty (B.C. 978)—the Shishak of Scripture, whose daughter Jeroboam married. Among the other statues of gods may be mentioned that of Hapimoou, the Nile-god (No. 8), which is of sandstone, and of the same period as the Pasht just mentioned. In the lap of this figure is an altar of libations, from which hang plants and water-fowl. Among the statues or fragments of statues not yet mentioned are—No. 26, a sandstone statue of Seti Menephta II., a Pharaoh of the nineteenth dynasty (B.C. 1270–1170), seated on a throne, and holding a ram's head placed on a small altar by both hands on his knees; No. 61, a colossal statue of an unknown monarch in red granite; No. 75, a fragment of a gray granite statue of Horus or Har-em-hebi of the eighteenth dynasty, &c. Of the small statues ranged round the room, some are of exceedingly neat workmanship. But of all the objects in the saloon that remain to be noticed, none merit so much attention as the two marked respectively No. 111 and No. 31. The former is a colossal statue of black basalt, found in the year 1785 in the natron lakes near Rosetta. It represents Uah-ha-ti-ra, or Apries, 'a functionary holding many offices under the twenty-sixth dynasty'—the dynasty which was subverted by the Persian invasion. The figure is kneeling, and holding in front a small shrine, which is inscribed with dedications to Osiris, Petur, and other gods. The features of this statue are extremely characteristic, and have somewhat of a negro cast. No. 31 is under the size of life, and represents a group of three persons—two full grown, a male and a female,

Pasht.



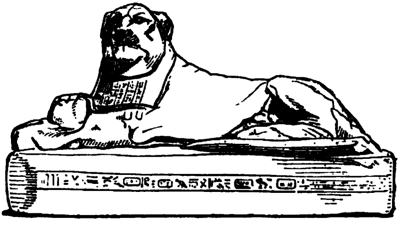
Uah-ha-ti-ra.

seated on a chair, the male on the right side with his right arm resting on his lap, while his left passes round the back of the female, the fingers resting on her left shoulder, and the female in a similar attitude; while between them, on a lower seat, is a smaller figure, apparently that of a child. From the inscription on the plinth, we learn that the figures represent Atu, a priest, his sister Hanur, and his son Neferhebf, all of whom lived in the reign of Amenophis II., of the eighteenth dynasty. The group was found in a tomb at Thebes. The material is sandstone; but the figures are thickly painted. The head-dresses of both the male and female are painted black, as are also their eyebrows and eyelashes, and the beard of the male; the face in both is of a dull-red, representing flesh colour, which colour extends in the male to the navel, between which and the ankles is an unpainted space representing a garment, with a hieroglyphic inscription in blue running down the front of it; in the female only the throat is left exposed, and the garment extends thence to the ankles; in both the feet are red; and the child is red all over. The expression of the group is by no means unpleasing. Nos. 29 and 36 represent similar domestic groups of two persons only.

It remains now only to notice that class of Egyptian sculptures to which the general name of *sphinxes* is applied. The sphinx was an imaginary monster in the mythology of the early world, and became afterwards a favourite subject of sculpture among the artists of all the primitive nations—Hindoos and Greeks, as well as Egyptians. What may have been the precise signification of the emblem in ancient mythology it is impossible to say; the idea of the sphinx as an object of art, however, seems to have been that of a combination of animal forms not found in nature, for the purpose of impressing the mind with mysterious terror, mingled with a feeling of repose. The sphinxes of different nations varied: of the sphinxes of Egypt six distinct kinds have been pointed out:—the simple lion; the lion with the ram's head, or crio-sphinx; the lion with the hawk's head; the lion with the man's head; the lion with the woman's head; and the lion with the woman's head and arms. No winged sphinx has been found in Egypt.

Sphinxes were usually placed at the entrance to temples. The simple lion-form sphinxes were placed in pairs, one on each side of the door; the others in other positions, and in considerable number. Sometimes one approached the front of a temple through a long avenue of colossal sphinxes, placed at intervals on each side, the effect of which must have been most imposing. Such avenues of sphinxes are to be seen at Carnak and Luxor, and at Essaboa in Nubia. Sometimes, however, sphinxes were placed in isolated positions, as individual specimens of colossal sculpture. Such appears to have been the enormous man-headed sphinx sculptured out of a calcareous rock, of which the head and shoulders alone are now visible above the sand near the great pyramids of Gizeh. In length this sphinx is not less than 143 feet; in front its height is 62 feet. In the museum (No. 58) is a fragment of the plaited beard of this sphinx. A sphinx, 22 feet long, of fine rose-coloured granite, is in the museum at Paris. The approach to the temple of Har-em-hebi, or Horus, at Carnak, was lined by colossal crio-sphinxes, some of which were 17 feet long. The colossal ram's head 'emblem of Amer-ra,' No. 7, which is one of the objects captured from the French in 1801, belonged to one of those sphinxes. It is of an exceedingly soft, dirty, yellow sandstone; the length of the face is 3 feet 6 inches; that of the remaining ear is 1 foot; that of the horn measured along the curve 4 feet 11 inches. This head is a very good specimen of sculpture; the mild expression of face peculiar to the sheep is extremely well given.

The complete sphinxes in the museum are all of comparatively small size. Nos. 10 and 13 are a pair of hawk-headed sphinxes, emblems of the god Munt-ra that were brought by Belzoni from the great temple of Ipsamboul. The material is a soft light sandstone; the length 41 inches; the execution inferior. No. 82 is a sphinx of limestome, by a Roman artist. No. 444* is a small sphinx found in the vicinity of the great sphinx of the pyramids, near which also were found the two small lions, Nos. 429 and 431. But the finest of all the sculptures of the sphinx description that the museum contains, are the two large lions of red granite that stand at the entrance to the saloon, marked No. 1 and No. 34. These beautiful sculptures were found by Lord Prudhoe in 1829 at Mount Barkal, where, apparently, they once adorned the front of a temple. When discovered, they were nearly perfect; but they were considerably mutilated by the persons intrusted with the charge of their carriage through Egypt. On the mane of the one (No. 1) in front is inscribed the name of Amen-asro, a supposed Ethiopian king; and on the base is a dedication by the Pharaoh Amenophis III. (Memnon), in whose reign both must have been sculptured;



the other has the name of the same Amen-asro, but the dedication round the pedestal is from Amen-Cuanch, the son of Amenophis III. 'As works of art,' say the Society of Dilettanti, 'they display not only wonderful skill in producing a soft and undulating surface on a very hard and intractable material, but surprising knowledge of the animal structure, especially in the position and termination of the bones.' With a glance at these two fine sculptures, and at another sculptured animal form, that may be taken as a characteristic specimen of Egyptian art—the colossal scarabæus, or beetle, of dark granite, marked No. 74—let us quit the Egyptian Saloon, and go in search of sculptures of later times and nations.

II.—Assyrian Sculptures.

Little, if at all, later than the Egyptians in the career of civilisation, were some of the numerous nations that, from time immemorial, inhabited the great tract of Western Asia stretching from the Mediterranean to the Indus. These nations were divided into two great branches or families—the Semitic family, including the Syrians, the Jews, the Arabs, the Phœnicians, the Assyrians, &c.; and the Indian or Indo-Germanic family, including the Persians, the Hindoos, &c. Particular districts in the regions occupied by both those families outstripped others in culture. Thus in the vast tract occupied by the Indo-Germanic branch, it was the north-western part of Hindoostan that first presented the evidences of high civilisation—regular governments, manufactures, important and well-built cities, temples, and works of arts. In the more western tract occupied by the Semitic races, several districts appear to have started contemporaneously in the career of improvement. On the coast of the Levant, for example, the Phœnicians and the Jews attained eminence at a very early period—the former as a great maritime people, the latter as a nation of agriculturists; while farther to the east, on the banks of the Euphrates and Tigris, were various great cities, serving as political and commercial centres to the countless nomadic tribes of Syria and Arabia. These cities were at first independent of each other, each having its own name, its own government, &c.; but ultimately they were united under one rule, and the territory on which they stood became the central province of a great Semitic empire, called the empire of the Assyrians. In this empire the Phœnicians and the Jews were at length included. While, therefore, a complete collection of Semitic remains should include specimens gathered from the sites of the ancient cities of Phœnicia and Palestine, as well as from the sites of the ancient

Mesopotamian cities of the Assyrian conquerors, yet, if a selection is to be made, the preference ought to be given to Assyrian remains proper, as being the most comprehensive and typical in their character.

Of the history of the Assyrians and their empire very little is known, and that little is chiefly derived from the Biblical narratives, where allusions are occasionally made to the Assyrians in their connection with the Jews. That the fertile lands of Shinar or Mesopotamia, lying near the rivers Euphrates and Tigris, were among the first that were colonised by the human race in their pristine Asiatic wanderings, is a fact distinctly asserted in the 10th chapter of Genesis—'And Cush' (the son of Ham), it is there stated, 'begat Nimrod: he began to be a mighty one in the earth, ... and the beginning of his kingdom was Babel, and Erech, and Accad, and Calneh, in the land of Shinar. Out of that land went forth Asshur, and builded Nineveh, and the city Rehoboth, and Calah, and Resen between Nineveh and Calah: the same is a great city.' Of the eight primeval Assyrian cities here mentioned, the slow growth of which during the ages preceding authentic history must be left to be conceived by the imagination, that which ultimately attained the pre-eminence was Nineveh, or Ninus, situated on the banks of the Tigris. The notices of this city that remain represent it as having been at one time of enormous extent and singular magnificence. In shape it was an oblong rectangle, one side being considerably larger than the other; it was surrounded by walls 200 feet high, and so broad, that three chariots might drive on them abreast; 1500 towers were ranged at intervals round these walls; and the whole circumference exceeded sixty miles, large parks and vacant spaces being left between the walls and the houses for the accommodation of the country people and their cattle in case of the invasion of the adjacent territory. An idea of the grandeur of the city in and about the eighth century before Christ may be gathered from the casual allusions in the prophecies of Jonah and Nahum, both of which expressly concern Nineveh. Thus in Jonah, Nineveh is called 'an exceeding great city of three days' journey (round about),' in which there were 'more than six score thousand persons that cannot discern between their right hand and their left hand' (that is, children, and a population of 120,000 children would argue a total population of at least 600,000), 'and also much cattle;' and Nahum, in predicting the siege and destruction of Nineveh, indicates its vast extent and great wealth by such brief touches as these:—'The chariots shall rage in the streets; they shall justle one against another in the broad ways; they shall seem like torches; they shall run like lightnings'—'The gates of the rivers' (sluices of the canals, &c.) 'shall be opened; and the palace shall be dissolved'—'Take ye the spoil of silver; take the spoil of gold, for there is none end of the store and glory out of all the pleasant furniture'—'Thou hast multiplied thy merchants above the stars of heaven,' &c. &c. The state of magnificence depicted in these allusions seems to have been attained by the city as early as the twelfth or thirteenth century before Christ, to which period chronologists refer the reigns of the two great mythical sovereigns of Assyria—Ninus, the reputed founder of the empire, and his wife and successor Semiramis. To Ninus, indeed, the Greek historians assign the honour of having built Nineveh, while they make Semiramis the founder of Babylon; according to the Scriptural account, however, which ascribes the foundation of the former city to Asshur, and that of the latter to Nimrod, Ninus and Semiramis are to be regarded as only the repairers or second founders of the two cities attributed to them. Among their successors on the Assyrian throne were the following kings mentioned in Scripture:—Pul (B.C. 761), who invaded the territories of Menahem king of Israel (2 Kings, xv. 19); Tiglath-pileser (B.C. 740), who assisted King Ahaz of Judah in a war against Syria (2 Kings, xvi. 7); Shalmanassar, who was contemporary with King Hezekiah of Judah, and who put an end to the kingdom of Israel by taking Samaria (B.C. 722), and carrying away the ten tribes into captivity; Sennacherib, who invaded Judæa, and besieged Jerusalem (B.C. 714); and Esarhaddon, who succeeded Sennacherib. These and the other successors of Ninus, whose names are lost, were virtually the supreme rulers of all the Semitic nations from the Tigris, where their own capital stood, to the shores of the Mediterranean. About the year B.C. 626, however, the sovereignty of the Semitic populations was transferred from Nineveh on the Tigris to Babylon on the Euphrates by a warrior named Nabopolassar or Nebuchadonosor, whose predecessors had governed in the province of Babylonia as lieutenants of the kings of Nineveh. From this period till the year B.C. 606, Nineveh attempted to regain its ancient status; but in that year it was taken by the united armies of the Medes and Babylonians, and laid in ruins, according to the predictions of the prophet Nahum. So complete was the destruction of the once great city, that, during the times of the Babylonian and Persian empires, hardly any remains of it were to be seen; and travellers like Herodotus, on visiting the East, were obliged to content themselves with merely looking at the site, and collecting such traditions as they could relative to its former condition. And if thus actually obliterated within a period of only two centuries from the date of its utmost prosperity, need we wonder if in modern times, after the lapse of twenty-two centuries more, its very site should have been a matter of dispute?

The extensive domains of the ancient Assyrian monarchs now form a part of the great empire of the Turkish sultan. That empire consists of twenty-eight eyalets or provinces, four of which lie in Eastern Europe, and twenty-two in Western Asia, the remaining two being Egypt (which, however, is in reality an independent monarchy) and the island of Candia or Crete. The population of the entire empire is estimated at about 23,000,000, of which the European eyalets contain about 7,000,000, and the Asiatic about 13,000,000. All the inhabitants of the Turkish empire are either Turks proper, professing the Mohammedan religion, or Rayas—that is, descendants of the Eastern Christians, whether Greeks, Sclavonians, or Asiatics, who originally possessed the various countries that now constitute the empire before they were invaded by the Turks. Each eyalet or province is governed by a pasha appointed by the sultan; the sanjaks, or subdivisions of the eyalets, are governed by inferior pashas; and the smaller districts into which the sanjaks are divided are governed by officers called beys. Travelling over the different portions of this great empire, foreigners have found in each matter for investigation. Not only is the empire itself generally an interesting spectacle, presenting as it does to the mere student a medley of institutions and customs so different from those that prevail in Western Europe, and to the philanthropic observer such a field for political and social reforms that are sure one day to be effected; but there is hardly a province of it that does not possess some special claim on the attention, in consequence either of its historical associations or of the traces that it still retains of primeval peoples and languages. Thus in the European pashaliks are to be traced the relics of the Macedonian and Greek populations, in Asia Minor are remains of once famous Greek cities, and in Syria and Palestine are scenes the historic interest of which can never perish. Over these tracts of country recent travellers have extended very careful researches, and every day some remote corner of the Turkish empire that had hitherto escaped description is entered and penetrated. As may readily be imagined, those Asiatic provinces of the empire—such as Bagdad, Mosul, Merash, and Bassora—among which are now parcelled out the territories that formerly constituted the kingdoms of Assyria and Babylonia, have received no small share of the notice of Eastern travellers. To the province of Mosul, in particular, corresponding, as it is known to do, with the central portion of the ancient Assyrian domain, and including, therefore, the site of the great city Nineveh, no ordinary amount of attention has been directed. This province, thinly inhabited by a mixed population of Mohammedans of the Turkish, Kurdish, and Arabic races, and Christians of different denominations, but chiefly Chaldæans or Nestorians, includes a tract of country on both sides of the Tigris above its junction with the Zab. Its chief town is Mosul, a place of about 50,000 inhabitants on the right bank of the Tigris, and situated on the commercial route between Bagdad and Armenia. It was formerly celebrated for its manufacture of *muslin*, to which article it gave its name; now, however, nothing is manufactured in it except coarse cotton cloth. On the opposite bank of the Tigris from Mosul, and connected with it by means of a bridge of boats, are two great grass-covered mounds, called respectively Kouyunjik and Nebbi Yunus (Tomb of Jonah) by the Turks. The first measures 7690 feet in circumference, and both are evidently artificial. The extent of these mounds, the vague traditions of the natives, whose minds, for many miles round, are still full of Nimrod, Asshur, Jonah, and other great names of primeval story, and lastly, the frequent discovery in the mounds themselves of fragments of sculpture, pottery, &c. had long led travellers to the conclusion that they marked a part of the site of ancient Nineveh. In 1820, Mr Rich, who, in his capacity of political resident of the East India Company at Bagdad, had already done so much for Oriental archæology by the investigation of the site of ancient Babylon, paid a visit to Mosul, examined the mounds in its neighbourhood, and collected a few bricks with cuneiform inscriptions, fragments of sculpture, &c. which, with similar relics gathered on the site of Babylon, were subsequently deposited in the British Museum—the whole hardly filling a case three feet square. It was not till the year 1842 that systematic excavations were commenced in the mounds of Mosul with a view to discover whether they contained architectural remains. In that year M. Botta, French consul at Mosul, caused openings to be made in the mounds; but owing probably to the smallness of the scale on which his operations were conducted, nothing of importance was brought to light. Accident, however, having turned his attention to a mound of similar character some miles to the north of Mosul, and forming the site of the modern village of Khorsabad, his labours there were rewarded with complete success, the very first excavation disclosing the remains of an ancient Assyrian building, the walls of which were covered with elaborate sculptures in bas-relief, representing sieges, battle scenes, processions, &c. Assisted in the prosecution of his researches by very liberal grants of money from his government, M. Botta was able, in the course of three years, to acquire a very important collection of Assyrian antiquities, with which he returned to Europe. They are now deposited in the national museum of the Louvre.

Among the Europeans in the East that took an interest in the progress of M. Botta's discoveries, was an English gentleman, Mr Austen Henry Layard, who had for several years been travelling through the various parts of Asiatic Turkey, partly for pleasure, and partly for the purpose of research. On his first journey along the banks of the Tigris in 1840, Mr Layard had visited not only the great mounds near Mosul, but two other sets of mounds of similar appearance farther down the river—the one at Nimroud, a village near the junction of the Tigris and the Zab, where local tradition still points it out as the ruin of the original city of Nineveh built by Asshur or Athur, the lieutenant of Nimrod; and the other at Kalah Sherghat, fifty miles farther south. He had been particularly struck with the ruins at Nimroud, and had resolved to make an effort to have them examined; and accordingly, on his return to Mosul in 1842, finding M. Botta already engaged in a similar enterprise on the mounds near that town, he had directed his attention to Nimroud. The distance of this place from Mosul, however, prevented M. Botta from following Mr Layard's advice; and it was not till the year 1845 that excavations were commenced at Nimroud. Towards the close of that year Mr Layard arrived at Mosul from Constantinople, furnished with letters of introduction to the pasha of Mosul and the other local authorities; and immediately removing to Nimroud, began secretly, with the help of several Arabs whom he hired, to dig in the mound supposed to contain the ruins. The result of the first day's labour is thus described in Mr Layard's interesting volumes:—'Twenty minutes' walk (from the village of Naifa) brought us (himself and the Arabs he had hired) to the principal mound. The absence of all vegetation (owing to the lateness of the season) enabled me to examine the remains with which it was covered. Broken pottery and fragments of bricks, both inscribed with the cuneiform character, were strewed on all sides. The Arabs watched my motions as I wandered to and fro, and observed with surprise the objects I had collected. They joined, however, in the search, and brought me handfuls of rubbish, among which I found with joy the fragment of a bas-relief. Convinced, from this discovery, that sculptured remains must still exist in some part of the mound, I sought for a place where the excavations might be commenced with a prospect of success. Awad (one of the Arabs) led me to a piece of alabaster which appeared above the soil. We could not remove it; and on digging downward, it proved to be the upper part of a large slab. I ordered all the men to work around it, and they shortly uncovered a second slab, to which it had been united. Continuing in the same line, we came upon a third; and in the course of the morning laid bare ten more, the whole forming a square, with one stone missing at the north-west corner. It was evident that the top of a chamber had been discovered, and that the gap was its entrance. I now dug down the face of the stones, and an inscription in the cuneiform character was soon exposed to view. Similar inscriptions occupied the centre of all the slabs, which were in the best preservation. Leaving half the workmen to uncover as much of the chamber as possible, I led the rest to the south-west corner of the mound, where I had observed many fragments of calcined alabaster. I dug at once into the side of the mound. We came almost immediately to a wall, bearing inscriptions in the same character as those already described; but the slabs had evidently been exposed to intense heat, were cracked in every part, and, reduced to lime, threatened to fall to pieces as soon as uncovered. Night interrupted our labours. I returned to the village well satisfied with their result.' The excavations thus fortunately commenced were prosecuted by Mr Layard with increased success, and on a more extensive scale, at various times during the years 1846 and 1847, his energy and perseverance overcoming all the obstacles that were presented by the prejudices of the native authorities. At first he conducted the search entirely at his own expense; but latterly, in consequence chiefly of the representations of Sir Stratford Canning, English ambassador at Constantinople, the British government were induced to grant a sum of money to the British Museum, to be applied in continuing the excavations under Mr Layard's superintendence.

The general result of Mr Layard's first series of researches may be thus summed up:—In the mounds of Nimroud the ground remains of four distinct edifices were more or less completely exposed to view—these edifices being designated by Mr Layard respectively, according to their positions, the *north-west palace* (part of which was cleared by the first day's digging), the *south-west palace*, the *central palace*, and the *south-east palace*. A series of upper chambers, apparently belonging to the north-west palace, were also laid bare in a more elevated part of the mound near the site of the rest of the palace. Over and above this, the whole face of the mound or set of mounds was sounded, so to speak, by trenches dug at different spots and in different directions, some of which disclosed pavements of brickwork lying underneath. Exactly similar were the discoveries made in the mound of Kouyunjik near Mosul, where M. Botta, in consequence of the hasty manner in which his excavations had been conducted, had been able to discover nothing. In this mound the remains of one great edifice were laid bare; and there was little doubt that farther excavations would bring more to light. Indeed, of the vast number of mounds scattered over the whole country between the Tigris and the Euphrates, there is, Mr Layard thinks, probably not one that, if properly searched, would not yield up interesting remains. Much, he thinks in particular, might be expected from proper excavations undertaken at the site of ancient Babylon; and only after a general antiquarian survey of Assyria and Mesopotamia, does he expect that we shall have a true idea of the greatness of the civilisation that once flourished in that part of the East. There is little doubt, however, that whatever farther discoveries remain to be made, those already made at Nimroud and Kouyunjik enable us to picture, with sufficient accuracy, the various arrangements of an Assyrian palace or other first-class edifice.

The walls of all the edifices excavated hitherto have been found to consist uniformly of masses of brickwork varying in breadth from five to fifteen feet, and lined or panelled to a certain height (from seven to twelve feet) on the inside with large slabs of gypsum or alabaster, sometimes plain, and sometimes sculptured. The brick found in these palaces is the ordinary sun-dried brick so generally employed in Assyria as a building material; the gypsum is of a coarse kind that is still found in considerable quantities in different parts of Mesopotamia. On the backs of all the gypsum slabs have been found inscriptions, containing the name, &c. of the king by whom the building was undertaken. These inscriptions must of course have been cut on the slabs before they were fastened to the brickwork; the bas-reliefs, however, covering the exterior surface of the slabs, and forming the ornamental facing of the various rooms, appear always to have been cut after the slabs were set up. The finest sculptured slabs, as indeed the most remarkable antiquities of all kinds, were found in the north-west palace at Nimroud, of which no fewer than twenty-eight chambers were explored. In various portions of the south-west palace the slabs crumbled away immediately on exposure, having evidently been calcined by the conflagration that originally destroyed the building. This was also found to be the case at Khorsabad during the excavations of M. Botta. The subjects of the sculptured panellings were found to be very various—single figures of kings, eunuchs, deities, &c.; battle-pieces, hunting-pieces, processions, &c.; all executed in a style peculiarly Assyrian, and distinguishable at a glance from the style in use in Egypt. At the doorways of the principal chambers were usually found sculptures representing a pair of gigantic winged bulls or lions with human heads. An Assyrian, therefore, looking round on the walls of one of these ancient rooms, covered one half with sculptures, and the other with cuneiform inscriptions, had presented to him, as it were, an illuminated page of his country's history and theology; and when to the effect of these spirited alabaster decorations round the walls, we add in imagination that of well-laid floors and richly-painted ceilings, we shall have an idea of the magnificence which must have met his eye.

The antiquities which, with much care and difficulty, Mr Layard has been able to send home from the scene of his labours, are but small fragments, so to speak, of the disinterred Assyrian palaces of Nimroud and Kouyunjik. They consist, 1*st*, Of specimens of cuneiform and other writing; 2*d*, Of specimens of the gypsum or alabaster bas-reliefs that lined the interior walls of the principal rooms, the slabs, however, having been in many cases curtailed and thinned, in order to make their carriage easier; 3*d*, Of detached sculptures; 4*th*, Of ivories, and other small miscellaneous ornaments found among the rubbish during the process of excavation.

CUNEIFORM INSCRIPTIONS.—Although the specimens of Assyrian writing discovered among the ruins of Nimroud, Kouyunjik, and Khorsabad, do not constitute a class of objects apart, but are found distributed alike over the bricks, the slabs, the detached sculptures, &c. yet it may be convenient, in the first place, to consider the nature of Assyrian inscriptions generally. According to Mr Layard, the Assyrians and all the other Semitic nations used two kinds of writing—the cuneiform, or arrow-head writing, consisting of characters made up of certain combinations of figures in the shape of wedges or arrow-heads; and the cursive, or common writing. The former, corresponding with the Egyptian hieroglyphic writing, was used for monumental purposes, and was written from left to right; the cursive hand, on the contrary (the characters of which were but forms of a general Semitic alphabet in use, with certain modifications, among the Hebrews, the Phœnicians, the Babylonians, &c.), was employed for more ordinary purposes, and was written from right to left. The great proportion of the inscriptions found among the Assyrian remains are in the cuneiform character; the specimens of the cursive writing are comparatively few.

Three great varieties of the cuneiform writing are known to antiquarians—the Semitic, the Persian, and the so-called Median, which some denominate the Scythic. Though radically similar, these three varieties of the cuneiform differ from each other in many respects: the Persian and Median, or Scythic, being apparently adaptations of the original Semitic by the two extra-Semitic nations whose names they respectively bear. Even among the Semitic nations themselves, who may be regarded as the inventors of this peculiar style of writing, different varieties of it were in use at different times—the simplest being the oldest Assyrian, of which we have examples in the inscriptions found at Nimroud; and the most complex being the later Assyrian, or Babylonian, the number of distinct characters in which (all combinations of the wedge) exceeds three hundred. It appears probable that the component parts of this ancient system of writing were originally mere straight lines, and that the wedge or arrow-head was a subsequent device for the sake of artistic effect or of durability. In the ruins of the south-west palace at Nimroud Mr Layard found a slab with a short inscription entirely composed of straight lines, and yet evidently identical alphabetically with the cuneiform. On some painted bricks in the north-west palace he found the characters shaped not like wedges, but like mallets or hammers. The wedge or arrow-head, however, became eventually the true elementary mark, and, as such, it was considered sacred. In accordance with some principle now unknown, a variety of combinations of this elementary mark were devised, each combination having a distinct phonetic value attached to it. Thus an alphabet was prepared, and an educated Assyrian or Persian, passing his eye over a line of arrow-head characters, was able at once to read it off, the one in the Assyrian, the other in the Zend or Persian language. The use of the cuneiform character among the Assyrians appears to have been hardly less extensive than that of the hieroglyphic among the Egyptians. If a victory was gained by an Assyrian king, the fact was commemorated by a bas-relief cut either on the smoothed face of a precipice, or on a pillar raised on purpose; and beside, or above, and sometimes even across this bas-relief, was cut a cuneiform inscription, telling the name of the king and a few other particulars. If a palace was built, care was taken to commemorate the name, &c. of the builder by a short formula cut on the back of every gypsum slab or block of stone required for it; while, as has been already mentioned, a part of the interior decorations of the principal rooms consisted of long cuneiform inscriptions alternating on the walls with historical and other bas-reliefs. For common documentary purposes bricks or tiles were employed, the inscription being either scooped out in the soft clay with a pointed instrument, or (which was not uncommon) impressed at once with a wooden stamp, and the brick or tile being afterwards dried in a kiln, and not by the sun's heat, as was the case with the ordinary bricks used in building. A common form of such inscribed bricks was that of a hollow hexagonal cylinder, the faces forming, as it were, separate pages. Among the specimens of inscribed bricks and tiles in the museum is one such cylinder, originally found among the ruins at Nebbi Yunus, opposite Mosul, and which had long been used as a candlestick by a Turkish family in that neighbourhood, when Mr Layard saw and procured it. It is somewhat mutilated; but on each of the faces are still to be seen about sixty lines of wonderfully minute cuneiform writing. Legal deeds and records, astronomical observations, &c. seem all to have been preserved by the Assyrians and Babylonians on such inscribed bricks, skins being employed only for writings of a less important description.

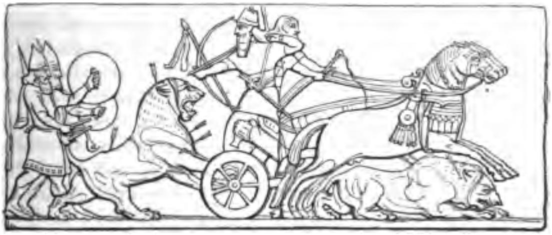
The art of deciphering cuneiform inscriptions is only in its infancy, the first successful attempt having been made by the German philologist Dr Grotefend so late as the beginning of the present century. Already, however, a sufficient advance has been made to warrant the hope of important results from future investigations. As it was from the trilingual inscription on the Rosetta Stone that the first hint was derived as to the interpretation of the Egyptian hieroglyphics, so the key to the interpretation of the cuneiform writing was first obtained by an attentive examination of certain similar trilingual inscriptions occurring in Persia. Certain recurring successions of marks in the cuneiform portions of such inscriptions having been identified with the Persian proper names in the appended translations, these successions of marks were carefully analysed into their component sounds, and thus the phonetic value of each mark was ascertained. The way having once been opened by the discovery of the phonetic value of a few marks, farther progress was not so difficult; and at present a considerable proportion of the cuneiform letters have been identified with the sounds they represent. The arbitrary symbolic value attached to certain marks has likewise been ascertained—as, for example, that a certain succession of wedges denotes the word 'city,' that another stands for the expression 'the son of,' &c. By applying these discoveries to the numerous inscriptions of Nimroud, Kouyunjik, &c. Mr Layard was able to trace the names of ten separate Assyrian kings all mentioned on the slabs; the first six in genealogical series, the seventh standing by itself, and the last three again genealogically connected. Taking these results in connection with other circumstances, he has been able also to come to approximate conclusions relative to the dates of the several buildings, and their relation to the general history of Assyria. The most ancient of all he concludes to be the north-west palace of Nimroud—the first opened in the course of the excavations. This palace, he believes, must have been founded in the very earliest age of Assyrian power, some nineteen or twenty centuries before Christ, and may possibly, therefore, be the very edifice that was built by Asshur, the lieutenant of

Nimrod. If so, the patriarch Abraham may have stood on its threshold. For many centuries, probably, it existed the chief edifice of the original Nineveh then spreading out northwards between the Tigris and the Zab. At length, about B.C. 1300–1200, a revolution happened that brought Assyria under the power of a new dynasty; the ancient palace of Nimroud was suffered to fall in ruins, and become covered by the earth of the mound on which it stood; and it was not until after some interval that the newer palaces, the remains of which have been found, were built near the same site. At or near the same time that these newer palaces were built at Nimroud, similar edifices were reared on the sites of the present Kouyunjik, Khorsabad, Karamles, &c.—the city having in the meantime extended itself so as to cover the whole vast parallelogram lying within these limits. These later Assyrian palaces survived till the final destruction of Nineveh in the year B.C. 606; and it is to them that allusion is made in the prophecies of Jonah, Nahum, Ezekiel, &c. who speak of the magnificence of the Assyrians. Their destruction being caused by fire, they still exhibit in their ruins traces of the action of the flames; while in the ruins of the older palace of Nimroud, already buried, as they were, at the time of the conflagration, no such marks are to be discovered. The ancient palace of Nimroud, therefore, represents the earliest period of Assyrian history; it is in its ruins that we are to look for the most ancient specimens of Assyrian art, and for the symbols of the primitive Assyrian worship; the other palaces of Nimroud, and those of Khorsabad and Kouyunjik, exhibit the art and civilisation of the country in a more advanced, and, on the whole, more corrupt stage.

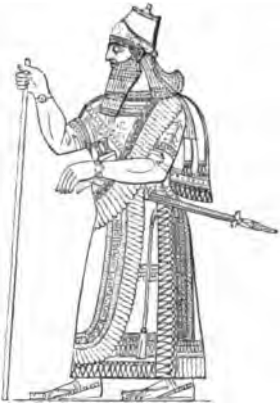
BAS-RELIEFS.—The bas-reliefs taken by Mr Layard from the different palaces discovered by him, and now deposited in the museum, are numerous and interesting. They are all from the interior walls of the chambers, the similar slabs with which, to a certain height at least, the exteriors of the buildings were probably covered, having entirely disappeared. The slabs vary in size and thickness; the largest, which were originally about twelve feet high, having been found at Kouyunjik. At Nimroud the taller slabs were about ten feet high; they were erected at intervals round the walls, and the spaces left between them were filled up with massive slabs, usually three in number, the upper and lower being bas-reliefs, and the middle containing an inscription. The material is the same in all—the coarse Assyrian gypsum, or alabaster, which is tolerably white at first, but contracts, by exposure, a dirty-gray appearance. The subjects of the sculptures are exceedingly various—battle-scenes, hunts, domestic tableaux, single figures either real or mythical, inanimate objects, landscapes, &c. &c. The design and execution are, on the whole, surprisingly good, the former being decidedly best in the oldest sculptures—those of the north-west palace of Nimroud. As in Egypt, so in Assyria, art appears to have declined rather than advanced after a certain primitive epoch. As regards style, there is a very great difference between the ancient Assyrian and the ancient Egyptian sculptures. 'That,' says Mr Layard, 'which Assyrian art and Egyptian art have in common, would mark the first efforts of any people, of a certain intellectual order, to imitate nature. The want of relative proportions in the figures, and the ignorance of perspective; the full eye in the side face, and the warriors fighting, and the dead bodies scattered above or below the principal figures—are as characteristic of all early productions of art as they are of the rude attempts at delineation by children.' Though they agree, however, so far, Egyptian sculptures, and Assyrian sculptures, and especially those that are most ancient, present many points of difference. 'Neither the ornaments of the earliest palace of Nimroud,' says Mr Layard, 'nor the costumes, nor the elaborate nature of the embroideries upon the robes, with the groups of human figures and animals, nor the mythological symbols, are of an Egyptian character; they show a very different taste and style. The principal distinction between Assyrian and Egyptian art appears to be, that in the one (the Egyptian) conventional forms were much more strictly adhered to than in the other. The angular mode of treatment so conspicuous in Egyptian monuments is not perceivable in those of Assyria. The Assyrians, less fettered, sought to imitate nature more closely, however rude and unsuccessful their attempts may have been; and this is proved by the constant endeavour to show the veins, muscles, and anatomical proportions of the human figure.' On the whole, there is a much greater accordance with modern European taste in the Assyrian than in the Egyptian sculptures. This is particularly seen in the portraiture of the human figures. The bearded faces on some of the Assyrian sculptures have features quite such as our modern artists delight to draw in their sketches of fierce and magnanimous warriors; and in the sleek double-chinned countenances of some of the other figures, one almost recognises the comfortable type of physiognomy so common amongst ourselves. This accordance with modern taste

arises doubtless in part from the fact, that the ancient Assyrians had a greater resemblance than the ancient Egyptians to the modern European model; but it must be attributed in part also to the freer genius of the Assyrian artists. Freer in their drawing than the Egyptian artists, they were also less conventional in their colouring. From the traces of colour that still remain on the faces and dresses of some of the figures from Nimroud, it is evident that, like the Egyptians, they painted their bas-reliefs in various colours—red, blue, black, white, yellow, &c.—thus adding to their effect; but in their selection and arrangement of colours they were probably not tied down by any severe rule.

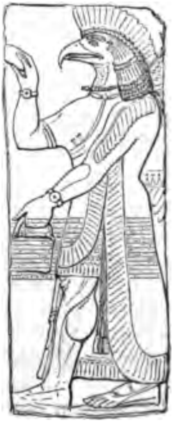
To notice all, or even many of the bas-reliefs, would be impossible; one or two must therefore be singled out as representative of the rest. Perhaps the finest yet discovered is one representing a lion-hunt. It was one of the long slabs that lined the principal chamber of the north-west, or most ancient palace at Nimroud. The following is the description of it given by a writer in the 'Athenæum:'—'The king is in his chariot, drawn by three horses, which the charioteer is urging forward, to escape the attack of an infuriated lion that has already placed its fore-paws upon the back of the chariot. The action and countenance of the charioteer are not without an expression of fear; and his flowing hair evinces the speed at which the horses are advancing. At this critical moment the royal descendant of the "mighty hunter" aims a deadly shaft at the head of the roaring and wounded monster, the position of whose tail and limbs is finely indicative of rage and fury. Behind the lion are two of the king's bearded attendants fully armed, and holding their daggers and shields ready to defend themselves in case the prey should escape the arrow of the king. Before the chariot is a wounded lion crawling from under the horses' feet; and the cringing agony conveyed in its entire action is well contrasted with the undaunted fury of the former. The existence of a claw in the tuft at the end of the lion's tail was disputed for ages; but here, in these ancient sculptures,



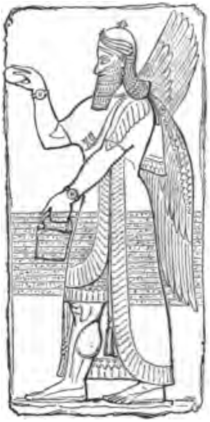
is an exaggerated representation in support of this curious fact in natural history. Whatever may have been the use or intention of this claw, its existence has been placed beyond all dispute by Mr Bennett, who, at one of the meetings of the Zoological Society of London in 1832, showed a specimen of it which was taken from a living animal in the society's menagerie.' In another slab we have a continuation of the same lion-hunt, representing the triumphant return of the king from the chase. Still 'fully armed, he stands in the centre of the composition, his bow in his left hand, while with his right he raises to his lips the cup which he has just received from the hand of the cup-bearer. At his feet lies the lion subdued, but not dead. He is followed by two beardless attendants (that is, eunuchs) who have accompanied him in the chase, and who bear a reserve supply of bows and arrows, as well for the king's use as for their own defence. They, as usual, wear no head-dress, and are attired in very richly-embroidered robes reaching down to the ankles. Behind these are the king's bearded attendants, distinguished by their short surcoats, reaching but little below the knee, and, as well as the last two, carrying a whip-shaped instrument—the emblem, apparently, of authority. All these, we may presume, have accompanied the king in the chase, and have arrived with him at the entrance of his palace, where he is met by the officers of his household. In advance of these latter stands the royal cup-bearer—the *sharbetgee* of modern times. This functionary, having presented his lord with the prepared beverage, is occupied in dispersing the flies which in hot climates assail with uncommon avidity all cool and sweetened liquids. The instrument which he holds in his right hand for this purpose will be recognised by all travellers in the East as the *minasha*—the very same fly-flap that is used at the present day. Over his left shoulder is thrown, exactly as in the present day, the long handkerchief or napkin richly embroidered, and fringed at both ends, which he holds in his left hand in readiness to present to the king to wipe his lips. Behind the cup-bearer stand two officers of the king's household in the attitude prescribed by Eastern etiquette—their hands folded quietly the one over the other. The bearded one appears to be the chief officer of the lower apartments (the *salamlik*) of the palace; the beardless one, the chief officer of the upper apartments (the *hareemlik*). Behind these again stand the royal minstrels, who celebrate the king's prowess in the battle and the chase, accompanying themselves on instruments of nine strings held in the left hand, and supported by a belt over the left shoulder. The instrument in the hand of the nearest performer terminates in a human head, probably to indicate that the bearer is the chief musician or leader of the chorus; for the likelihood is, that the *two* in this sculpture, as in all the representations of battles, sieges, hunts, &c. stand for *many*.' The constant dress of the king (see fig.) in these and other sculptures consists of a long robe richly fringed, with a shorter tunic closing down the front, and bordered and fringed, and a cap shaped like a truncated cone with a point at the top.



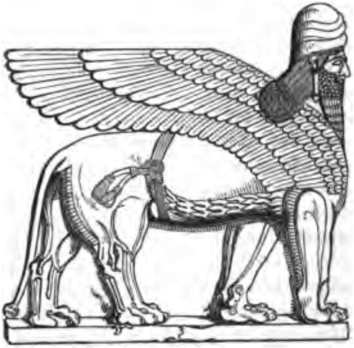
Among the other sculptures may be mentioned one representing a bull hunt; one representing the assault of a city, the wall being breached by a battering-ram; another representing warriors in their chariots advancing through a wood, &c. &c. In some of the bas-reliefs are represented strange animals—elephants, antelopes, the orang-outang, apes, monkeys, the rhinoceros, &c.; while in others are represented maritime and river scenes, with ships, fishes, sea-monsters, men swimming, &c. If the visitor wishes to study Assyrian sculpture, as shown in the execution of single figures, let him observe two tall slabs from Nimroud, one representing an eagle-headed, the other a human-headed deity. The former is about 7 feet 10 inches high, and 2 feet 10 inches wide. 'It represents a winged human figure with the head of a carnivorous bird. The figure is clothed in a short fringed tunic, reaching only to the knee, and tied at the neck with a tasselled cord, over which is an elaborate necklace with an ornament something like a pomegranate, and another of this favourite fruit, but quite distinct from the necklace, is hanging from a cord. Over the short tunic is a longer robe similarly trimmed. The whole is covered with an ample garment fringed and embroidered, which reaches to the ankle, leaving bare the right leg, which is advanced. The feet of the figure are covered with sandals. In the right hand, which is elevated, he holds a pine-cone (an emblem, apparently, as sacred with



the Assyrians as the scarabæus was with the Egyptians), and in the left hand, which is advanced across the body, is a basket or bag with a handle. His wrists are decorated with a rosette shaped bracelet, and on his right arm is a plain massive ring lapped over.' The execution of this sculpture (which is supposed to represent the Assyrian god Nisroch, mentioned in 2 Kings, xix. 37, worshipping at whose shrine Sennacherib was killed by his sons) is not nearly so good as that of its companion the human-headed deity, whose costume in other respects is the same.



DETACHED SCULPTURES.—The objects of this class that were found by Mr Layard among the Assyrian remains were comparatively few. A headless and otherwise mutilated sitting figure in black basalt, and seated on a block, was discovered at Kalah Shergat; and from this it may be argued that the Assyrian artists occasionally executed sculptures in full not unlike those of the Egyptians, procuring basalt and other hard materials from the mountains of Armenia. Bas-relief, however, appears to have been their favourite style; and even when executing massive sculptures out of single blocks, they were accustomed to combine this style with the other. Thus the gigantic-winged human-headed bulls and lions that constituted so favourite a subject with the Assyrian sculptor, and specimens of which have been found both at Nimroud and Khorsabad, always stationed at the entrances of the chambers, seem all to have been executed, partly in full, and partly in relief. 'The head and fore-part facing the chamber were in full; but only one side of the rest of the slab was sculptured, the back being placed against the wall of sun-dried bricks. That the spectator might have both a perfect front and side view of



the figures, they were furnished with five legs: two were carved on the end of the slab to face the chamber, and three on the side.' Several such winged-headed bulls and lions, both in alabaster and limestone, and measuring at least twelve feet long, were uncovered by Mr Layard during his excavations at Nimroud, and will ultimately be brought to England. While we write, however, only two fragments of such sculptures have been deposited in the museum—a gigantic head and foot of a winged bull in coarse yellow limestone.

Under the head of detached sculptures may be included one very remarkable monument, discovered in the centre of the mound at Nimroud. This was a small obelisk of coarse black marble, 6 feet 6 inches high, 2 feet wide at the bottom, and 1 foot 5½ inches wide at the top. Mr Layard thus describes it:—'Although its shape was that of an obelisk, yet it was flat at the top, and cut into three gradines. It was sculptured on the four sides; there were in all twenty small bas-reliefs, and above, and below, and between them, was carved an inscription 210 lines in length. The whole was in the best preservation; scarcely a character of the inscription was wanting; and the figures were as sharp and well-defined as if they had been carved but a few days before. The king is twice represented followed by his attendants; a prisoner is at his feet; and his vizier and eunuchs are introducing men leading various animals, and carrying vases and other objects of tribute on their shoulders or in their hands. The animals are the elephant, the rhinoceros, the bactrian or two-humped camel, the wild bull, the lion, a stag, and various kinds of monkeys. Among the objects carried by the tribute-bearers may perhaps be distinguished the tusks of the elephant, shawls, and some bundles of precious wood. From the nature, therefore, of the bas-reliefs, it is natural to conjecture that the monument was erected to commemorate the conquest of India, or of some country far to the east of Assyria, and on the confines of the Indian peninsula.' This obelisk is now in the museum. Although not very excellent as a work of art, it may possibly turn out to be of great historical value when antiquaries have advanced far enough in the study of the cuneiform character to be able to interpret the inscriptions it contains.

IVORIES, AND MISCELLANEOUS ORNAMENTS.—Among the rubbish of the various excavations at Nimroud and Kouyunjik, Mr Layard found a multitude of small objects that must have once formed part of the furniture of Assyrian palaces or other buildings. Of these objects, which belong properly to the ethnographical department of the museum, we cannot attempt here to give any detailed account. They consist of fragments of bronze utensils; terra-cotta vases, some of which are glazed with a blue vitrified substance, resembling that used by the ancient Egyptians; fragments of glass; engraved cylinders or rolling-seals; ivory sculptures and carvings, many of them delicately executed, and some of them showing traces of gilding; a small collection of bronze figures of animals, apparently used as weights, &c. &c. Many of these smaller antiquities have been greatly injured, and others were entirely destroyed during their transit from Assyria to England. The ivories, when first discovered, were so fragile as to fall in flakes almost when touched; this arose, however, from the loss of the gelatinous matter of the ivory; and means having been devised for restoring such matter artificially, they are now quite hard and sound. Should our collection of such minor remains be increased, there is little doubt but that, taken in connection with the representations on the bas-reliefs, they will enable us to construct as full and detailed a picture of ancient Assyrian life as, aided by the plenitude of similar materials, we now can of ancient Egyptian. How much even already may be done by this means towards depicting the manners and customs of the ancient inhabitants of Nineveh, may be seen by referring to the latter half of the second volume of Mr Layard's admirable work.

III.—The Greek and Roman Sculptures.

The Assyrian sculptures, as we have already observed, are to be regarded not merely as the remains of one great city which stood ages ago on the banks of the Tigris, but also as relics illustrative of the state of civilisation which prevailed in primitive times over the whole Semitic portion of Asia—that, namely, included between the Tigris, or rather the table-lands of Persia, on the east, and the Mediterranean and the River Halys on the west. The nations inhabiting this favoured region appear all to have attained their highest degree of culture as early as from B.C. 1500 to B.C. 1000; while to the east and west of them lay populations of much slower faculties, belonging not to the Semitic, but to the Indo-European branch of the Caucasian stock. On the east they extended as far as the Ganges; on the west they filled Asia Minor west of the Halys, and thence continued themselves into Europe. Borrowing, in the meantime, many ideas and customs from the more advanced Semitic nations which they environed, these Indo-European populations waited only for a favourable impulse to commence an independent career of civilisation.

This impulse was at length given by the appearance in the field of a new and original race, called the Pelasgians, accounted by some a mere subdivision of the general Indo-European family, and by others a distinct branch of the Caucasian stock. Overrunning the Indo-European parts of Asia Minor west of the Halys, and subsequently Greece, Italy, and other parts of south-eastern Europe, these Pelasgians mingled everywhere as a civilising element with the aboriginal nations. One division of them—the Hellenes or Greeks—attained a singular pre-eminence. Cradled in Greece Proper and the Peloponnesus, this finely-endowed race of men diffused themselves rapidly over all the adjacent lands, colonising the islands of the Ægean Archipelago, the western coasts of Asia Minor, as well as Sicily and Southern Italy. In the seventh or eighth century before Christ, and consequently while the Assyrian empire was still flourishing, the Greek race had already begun its splendid career—divided into a number of independent communities, each with its peculiar government and customs, but all bound together by the tie of a common language, a common religion, and common traditions. The different nationalities ultimately included under the general denomination of the Greek race may be thus enumerated:—In Greece Proper, the *Thessalians*, the *Epirots*, the *Acarnanians*, the *Ætolians*, the *Locrians*, the *Dorians*, the *Phocians*, the *Bœotians*, the *Megarians*, and the *Athenians*; in the Peloponnesus, the *Laconians* or *Lacedæmonians*, the *Messenians*, the *Arcadians*, the *Elians*, the *Argives*, the *Achæans*, the *Sicyonians*, and the *Corinthians*; in Italy and Sicily, various communities, such as the *Tarentines*, the *Syracusans*, &c. deriving their names from the cities they inhabited; in the Ægean Archipelago, the *Æginetans*, the *Lemnians*, the *Parians*, the *Rhodians*, &c. &c. each with their separate island; and lastly, in Asia Minor, the three great confederacies of the *Æolians*, the *Ionians*, and the *Dorians*—the first comprehending a number of Greek colonies that had been planted on the Lydian coasts by emigrants from Thessaly; the second, a number of similar colonies, planted somewhat later on the coasts between Lydia and Caria by emigrants of the Athenian stock; and the third, a number of colonies that had been planted by Peloponnesian emigrants on the coasts adjoining the island of Rhodes.

In all these various divisions of the general Greek family there were of course early attempts at art. Thus among the Athenians the first sculptor is said to have been Dædalus, a man of royal birth, who lived about B.C. 1400, and who made figures of wood that were greatly admired. Contemporary with him was Smilis, a native of Ægina, who made a statue of Juno at Samos. A pupil of Dædalus, and also an Athenian, was Endœus, who executed a seated colossal statue of Minerva in wood, and other works in wood and ivory, some of which were preserved to comparatively recent times. Considerably later (869 B.C.) was an artist of

Argos named Phidon, who is said to have struck the first coins ever used in Greece, for the people of Ægina. Later still were a Lacedæmonian sculptor and architect named Gitiadas, and a sculptor named Learchus, a native of the Italian-Greek town of Rhegium, one of whose productions was a hammer-worked bronze statue of Jupiter at Lacedæmon. After these, in the history of Greek art, come the three famous artists Rhæcus, Theodorus, and Telecles, mentioned by Herodotus as excelling all their contemporaries, the two former being Ionian Greeks of the island of Samos. Besides these are mentioned Depænus, Scyllis, Tectæus, Angelion, Medon, Dontas, Theocles, and others, all living about the same period (B.C. 600). The works of these early artists appear to have been chiefly in wood and bronze; sculpture in stone was much less common. On the whole, from the legends relative to the infancy of Greek art, it may be gathered that, while in almost all the Greek communities there was a taste for art, and even a tendency to make attempts in it, some communities speedily attained a greater reputation than others for the excellence of their artists; the most distinguished of these seats of early art being Athens, the island of Ægina, the island of Samos, and the Ionian cities of Asia Minor. From other circumstances we are justified in concluding that, on the whole, the Asiatic Greeks preceded their European kinsmen as lovers and patrons of the arts; and that, till their conquest by the Persians about 500 B.C., they had the honour of producing the sculptors and painters, as well as the poets, who were held in greatest esteem on both sides of the Ægean.

To this primitive period of Greek art, commencing with the early attempts of Dædalus and other legendary artists of unknown or doubtful date, and ending with the overthrow of art among the Asiatic Greeks in consequence of the invasion of their territories by the Persians (B.C. 500), dilettanti have given the name of the Archaic or Ancient Period. 'The remains of Greek sculpture of the Archaic period,' says a writer on the subject, 'are interesting to the antiquary, but offer very few attractions to the lover of the beautiful. Rigid and stiff in action, and rude and inelegant in form, the statues and rilievi of the infancy of Greek sculpture have very little to distinguish them in these respects from the earlier attempts of other nations. The first step towards a change was in the attempt to give action, and this was soon attended by fresh peculiarities of shape or figure in the parts. In this stage there is great energy or violence in the general design, with a lumpy or knotty character of form. The general proportions of the figures are thick in comparison with the length of parts. The breasts and shoulders are wide and broad, while the hips are narrow. The thighs and calves of the legs are large and heavy for the knees and ankles, and the feet are long and clumsily shaped. The treatment of the head is peculiar in the sculpture of this early period. The eye is usually long and narrow, and is slightly raised at the outer extremity. The mouth is open, and, owing to a slight curve or elevation at the extremities, has the expression of smiling. On the most ancient coins the hair is wiry, the lines being parallel and close together, in the apparent endeavour to give the effect of the whole by imitating every hair. This was more successfully attempted by executing the hair in masses; some very ancient works exhibit examples of this, where the effect is partially produced by small knobs or lumps. At a more advanced period the hair is executed in a more minute and careful manner, and with a more precise arrangement, combining, as it were, the particular character of the earliest treatment with the more general effect attempted in the next stage of art. In this the hair is brought in nearly straight lines over the head, but it terminates in small round curls, which are arranged with great regularity; and sometimes in two or three rows over the forehead, extending on each side to the temples and ears. In male figures, the beard, wherever it occurs, is wiry, and exhibits elaborate execution. The draperies in the sculpture of this early time are extremely thin, lying close to the figure (or to the ground if in reliefs), excepting at the edges of the folds, which are sharp and angular; these are arranged with the greatest precision, with the edges shown, and terminating in a sort of regular zig-zag series of lines. All these peculiarities are characteristic of the most ancient, or, as it is called, Archaic art; and whenever imitations of it have been made in later times, these features of action, form, and treatment of drapery have been observed.' *

With the downfall of the power and consequence of the Greek states of Asia Minor commences a new epoch of Greek art. Driven from their native cities by the Persians, the artists of Asiatic Greece sought refuge among their European countrymen. Athens, Corinth, Sicyon, and Ægina, but especially the two last, became the great schools of sculpture for all Greece. Here artists congregated; here bronzes and statues were executed for sale; and here any Greek city or sovereign that had a commission to give was sure to find a sculptor willing to undertake it. Nor were such commissions few. More artistic in their tastes than any people that ever lived, the Greeks had from the first delighted in adorning their cities with fine temples, theatres, statues, &c.; and their sudden elevation, after the Persian conflict, to the position of

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* Article 'Sculpture,' Penny Cyclopædia.

the most powerful race in the civilised world, only tended to increase their love for such magnificence, at the same time that it increased their means for indulging it. The century succeeding the battle of Marathon (B.C. 490–390) was, accordingly, not only the period of a splendid outburst of warlike, political, and literary genius among the Greeks—it was the period also of their attainment of high eminence in the fine arts. During that period there was not a Greek city, however poor or paltry, from the confines of Macedon to Sicily, that could not boast of its theatre, its statue of Jupiter, or Hercules, or Venus, or Juno, and its brazen likeness of some distinguished man or other; while in the larger cities—such as Athens and Corinth—the fine buildings and sculptures were all but innumerable. To supply so extensive a demand for works of art, the number of artists—architects, sculptors, painters, and decorators—was necessarily very large. Besides hundreds of inferior sculptors, whose names have perished, there lived during this period such distinguished artists as Callon, Glaucias, Onatas, Calliteles, Calamis, Calynthus, Hegesias, Myron, Canachus, Pythagoras, Ageladas, Alcamenes, and Polycletus. All these men ranked high in their profession, especially Onatas, who was a native of Ægina, and was much employed by Gelon, tyrant of Syracuse; Pythagoras, a native of the Italian-Greek city of Rhegium; Ageladas, who was a native of Argos; Myron, who was either an Athenian or a native of Eleutheræ; and Polycletus, who was a Sicyonian. Each of these artists was celebrated for some particular excellence in his mode of treatment, or for some particular mechanical innovation that he had introduced; and it was in consequence of their united improvements that sculpture gradually lost that hardness and clumsiness which had distinguished it during the Archaic period, and assumed the characteristics of what dilettanti call the grand or sublime style. All the sculptures executed during the period under notice are in this style. It attained its perfection in the works of the great Phidias, 'the sculptor of the gods' as the ancients called him, to denote his pre-eminence over all other artists, including even his contemporary Polycletus, notwithstanding that in some respects these two great sculptors were accounted rivals. Phidias was a native of Athens; he was born B.C. 488, and died B.C. 432. His productions, which were very numerous, were of all kinds, in bronze, ivory, marble, &c.; but he excelled most in what was called the *toreutic* art—that is, in the art of making statues of various materials, such as gold and ivory; wood, ivory, and gold, &c. Of his single works, the greatest was the celebrated statue of the Olympian Jupiter at Elis, executed by him during his exile from Athens. The statue was of colossal dimensions, and of the kind called by the Greeks *chryselephantine*—that is, composed of gold and ivory. It represented the god seated on his throne in majesty, his brows crowned with an olive wreath, and his right hand holding a figure of Victory. Of this great sculptor we shall have more to say when we come to consider the Elgin Marbles.

As Phidias is considered the head and representative of the grand or sublime style of sculpture among the Greeks, so the most distinguished artists of the succeeding school (B.C. 390–324) were Praxiteles and Lysippus. The birthplace of Praxiteles is unknown—Lysippus was a Sicyonian. The changes in sculpture effected by these artists is thus described by the writer already quoted:—'When the restrictions which originally confined sculpture to religious purposes and prescribed forms had once been disregarded, and the art was applied to represent objects of general beauty and interest, it rapidly underwent changes. Art had gradually been relieved from the dryness and hardness of the Æginetan school, and Phidias produced out of it the grand character which marks his period; but it appears there was still remaining a severity both in the forms and in the treatment in the works of some of the artists of this school, which it was left for a sculptor of a succeeding age to remove. This change was effected by Praxiteles. He succeeded in introducing an entirely new quality of art. The grand, the sublime, and the severe, gave way to the soft, the flowing, and the graceful. Praxiteles worked in bronze and in marble; but his most beautiful and admired performances were probably in the latter material. He is supposed to be the first sculptor that ventured to make a statue of Venus entirely naked.' Among the most celebrated works of Praxiteles were a Bacchus, a Satyr, and an Apollo Sauroctonos (that is, killing a lizard) in bronze; and in marble a Cupid, and two statues of Venus—the one draped, which was purchased by the people of Cos; and the other naked, which was purchased by the Cnidians. The Venus of Cnidus was his masterpiece, exhibiting the peculiar characteristics of his style in their utmost perfection. Contemporary with Praxiteles, or only a little later, was Lysippus. The changes introduced by this famous sculptor appear all to have been in the same direction as those of Praxiteles—namely, towards elegance and finish. He made the heads of his figures smaller than his predecessors had done, his treatment of the hair was also more careful, and in all things he studied a certain fine beauty of proportion. How closely he had studied the theory of his art, appears from his celebrated saying, that 'the older sculptors represented men as they were; he represented them as they appeared to be.' He is said to have worked exclusively in bronze, in which material he executed no fewer than 1500 different works.

He was the favourite sculptor of Alexander the Great, of whom he executed a series of statues, representing him at different periods of his life.

The school of sculpture, of which Praxiteles and Lysippus are the representatives, counted among its disciples many other eminent men, the immediate successors of these two great masters. Such were Cephisodotus and Eubalus, the sons of Praxiteles; Pamphilus, his pupil; Daippus, Bedas, and Euthyciates, the sons of Lysippus; and Tisicrates, his pupil; Xenocrates, who wrote a book on sculpture; Chares, a Lyndian, and the sculptor of the famous Colossus of Rhodes; Daniyas, Hermocles of Rhodes, Isigonus, Pyromachus, &c. The assertion of Winckelmann, therefore, is not strictly true, that Greek sculpture fell into decline after the dismemberment of the empire of Alexander (B.C. 324). There is, indeed, a certain amount of truth in the saying of that author, that 'in the arts depending on design, people begin with the necessary; after that seek the beautiful; and finally, fall into the superfluous:' nor would it be absolutely wrong to say that, after the time of Lysippus, Greek sculpture may be considered as having left the second, and entered on the third of these stages. In Greece itself, at least, the art almost ceased to be practised. Held by the Macedonians in a state verging on slavery, the various communities of Greece proper, including the Athenians, fell into a condition of despondency and poverty highly unfavourable to the culture of art. Accordingly, it was rather in the other parts of the great Greek world that artistic talent appeared at this period—in Syria, where it was patronised by the Seleucidæ; in Egypt, where it was encouraged by the Ptolemies; and in Rhodes and other parts of Asia Minor, where it was still sheltered by a certain amount of political freedom. In such places there was no lack even of original inventive genius. Besides the artists named above as the successors of Lysippus, and of whose works the ancient critics have left us very favourable accounts, it is probable that we ought to refer to this period several others, of whose works specimens yet remain; and among them, Agesander of Rhodes, and his two sons Polydorus and Athenodorus, the sculptors of the famous group of the Laocoon. The epoch of these artists, and consequently of their great masterpiece, is indeed somewhat uncertain, some making them contemporary with the sons of Lysippus, and others placing them much later; but at all events they belong to the age subsequent to that of Alexander; and at whatever time during that age their work was executed, the art of sculpture, we must surely conclude, was still far from extinction. During the period, in short, of Alexander's successors, there was yet abundance of artistic talent everywhere diffused over the Greek world, ready to concentrate itself in any particular spot that offered opportunities for its exercise.

After the Romans had rendered themselves masters of the different parts of the Greek world in succession—of Sicily B.C. 241, of Macedonia and Greece B.C. 168–143, of Asia Minor B.C. 129, of Syria, Egypt, &c. B.C. 70–60—Rome became the artistic as well as the political metropolis of the world. Thither, as spoils of war, were carried the most valuable works of art that were found in the conquered Greek cities; and thither also flocked Greek artists, attracted by the hope of new employment. The Romans themselves were not an artistic people. During the first few centuries of their national existence, the only works of art they had were probably the productions of the foreign artists—either Etruscans or Italian Greeks—paid to execute them. But though not gifted with original artistic genius, the Romans had that kind of fondness for works of art which consists in a taste for what is costly and splendid. Hence when they came in contact with the Greeks as conquerors, there was nothing for which they showed such an avidity as the statues, paintings, &c. with which the Greek cities and temples were adorned. After the capture of Syracuse (B.C. 212), the Roman general Marcellus stripped that city of its finest works of art, and sent them as trophies to Rome; his conduct was imitated by Mummius after the capture of Corinth (B.C. 143); and the dictator Sulla himself was a careful collector of all such works of art as interested him. Julius Cæsar, Cicero, and many other eminent Roman citizens, possessed extensive galleries of Greek sculptures and paintings; and one private collector, Verres, had a passion for such antiquities that amounted to a mania. This man, who was prosecuted for rapacity and misgovernment as prætor of Sicily, had in his possession genuine works of Praxiteles, Polycletus, Myron, and other great artists, procured in many cases by positive theft. During the reign of Augustus also, sculpture met with ample encouragement. Not only was the practice of collecting masterpieces from all parts of the Greek world continued, but living artists found plenty of occupation in executing the numerous statues of the emperor, of his chief generals and senators, and of other rich or distinguished persons for which there was a demand. Among the Greek artists resident in Rome during or about this period were Pasiteles, a native of Calabria; Colotes, the second artist of that name; Arcesilaus; Strongylion; Evander, whom Horace admired; Cleomenes, who made the fine statue of Germanicus; and Diogenes, an Athenian, who executed the sculptures of the Pantheon for Agrippa. Under the immediate successors of Augustus, sculpture still maintained its place as a Roman luxury. Tiberius nearly roused an insurrection by removing a fine statue by Lysippus from a public part of Rome to his own palace; nor were the people pacified till it was replaced. Various works of importance were executed for Caligula and Claudius. But of all the emperors, none was a more munificent patron of art than Nero. His favourite sculptors were Menodorus and Zenodorus, both Greeks; and it was probably to his order that some unknown artist executed the masterpiece now known as the Apollo Belvidere. Of the reigns of Vespasian, Titus, Domitian, and Nerva, few monuments survive; but under Trajan, Hadrian, and the Antonines, there was a fresh outburst of artistic invention. 'It was by Hadrian,' says Sir Henry Ellis, 'that the taste for portraits in statuary was so generally extended among the noble and opulent citizens of Rome; his own villa was filled with interesting and valuable remains of ancient art, together with statues and busts both of his living and deceased friends. He was a greater encourager of sculpture than any preceding emperor; but the names of the artists whom he so constantly employed we know not—those only of Austeas, Papias, and Zeno, occur on the plinths and fragments discovered among the ruins of his villa. The time of his successors, the Antonines, was most remarkable for the character and high finishing of heads intended as portraits, particularly of the imperial busts. The minute labour shown in the hair is in strong contrast with the bold effect of the more ancient style.' Sculpture, which had thus assumed what may be considered its characteristic Roman form, as mere *portraiture in statuary*, continued to be practised with some skill till towards the close of the third century. Such an accumulation of busts and statues was there in Rome at this period, that it was supposed their number exceeded that of the living population. But the spirit of art was gone; from being a noble profession, practised by men of genius, sculpture became a mere mechanical trade, on which rich men employed their slaves: even the power of correct imitation was lost; and before the period of the division of the empire and the transference of the seat of power to Constantinople, there was hardly a man in the Roman empire worthy of the name of sculptor. Still, however, some species of taste for works of art remained; and when Constantine transferred the seat of sovereignty to the East, he carried with him a vast number of the monuments, statues, and other antiquities that had been collected by his predecessors in Rome.

From the brief sketch we have thus given of the progress and decline of sculpture among the Greeks and Romans, it will be seen that there were five periods in the history of the art:—*1st*, The Archaic Period of Greek sculpture, extending from the time of the first legendary sculptors, Dædalus and his contemporaries, to the era of the Persian wars (B. C. 1400–500); *2d*, The Sublime Period of Greek sculpture, or the period of Phidias and his contemporaries (B. C. 500–400); *3d*, The Beautiful Period of Greek sculpture, or the period of Praxiteles, Lysippus, and their followers (B. C. 400–324); *4th*, The Mixed Period of Greek sculpture, extending from the dismemberment of the Greek empire of Alexander to the establishment of the Roman Empire (B. C. 324–48); and *5th*, The Period of Roman sculpture, or, as it should rather be designated, the Period of Greek sculpture as it was continued under Roman patronage—hardly a single sculptor of Roman times having been a native Roman.

To illustrate fully to one's-self the progress of the art through these successive periods, one would require to pass in review a complete series of the works of Greek artists, from the rough and knotty attempts of the Archaic period, to the spiritless busts of the later Roman times. Unfortunately it is only in imagination that we can behold such a series. Of the myriads of ancient statues and sculptures that once existed, the vast majority have perished; destroyed either by private neglect and cupidity, by the mere influence of time and weather, or by wholesale acts of armed barbarism. Works of the more precious materials—as, for example, chryselephantine statues, and other curious specimens of the toreutic art—were naturally the first to perish. But even of the bronze and stone performances of the ancient sculptors, the proportion that remains is miserably small. Of those, too, that do remain, hardly any can be distinctly identified as the original works of great sculptors whose names we know. In all the European museums there does not exist an ancient piece of sculpture of which it can be certainly said—this is a Rhæcus, a Myron, an Ageladas, a Polycletus, a Praxiteles, or a Lysippus. Sometimes, indeed, an enthusiastic collector fancies that a particular work may with probability be attributed to one of those famous masters; but in most cases the utmost that can be surmised with safety is, that some sculpture is an ancient copy of one of their originals. Long after the commencement of the Christian era, indeed, authentic works of various great artists were to be seen at Constantinople, including those two masterpieces—the Olympian Jupiter of Phidias, and the Cnidian Venus of Praxiteles. Both perished in a fire A. D. 477. Other important works, and among them a Hercules in bronze by Lysippus, were destroyed so late as the twelfth century. Of such relics as are left us, it is even impossible in many cases to fix the date. Thus the Apollo Belvidere is by no means ascertained to be really a work of the reign of Nero; and regarding the date of the Laocoon, as has already been mentioned, there is such a discrepancy of opinion, that it cannot be certainly affirmed whether that masterpiece suggested to Virgil his fine description of the Laocoon, or whether the sculptor did not design it to illustrate Virgil!

Notwithstanding this uncertainty, however, as to dates and names, and notwithstanding also the paucity of the remains themselves, it is yet true that in the Greek and Roman marbles now existing in the various European museums, we have not only ample materials for studying the principles of ancient sculpture in its best age, but also sufficient means for tracing the progress of the art during different ages. Fortunately there is hardly any European collection richer in this respect than that in the British Museum. Bearing the foregoing historical sketch in mind, therefore, let us now pass in succession through the various rooms of this great institution that are specially devoted to the classic marbles.

THE LYCIAN ROOM.

Like the country of the ancient Assyrians, the territories in Asia Minor, once occupied by the numerous cities of the Æolian, Ionian, and Dorian Greeks, now form part of the great and neglected Turkish empire. Under the name of Anatolia, the greater part of Asia Minor constitutes in fact but one division of this empire. Notwithstanding its ancient celebrity, this part of the world is now very little known. The southern coasts were first explored in 1811; the western coasts are somewhat better known; but the northern coasts and the interior remain still to be accurately described. There is no doubt that, when the whole country shall have been explored, numerous remains of ancient art will be added to our present stock; such parts as have already been visited having been found to contain the ruins of cities once great and famous. Everywhere, indeed, in Asia Minor the traveller finds matter to interest him. In the neighbourhood of poor Turkish villages, and amid the relics of different races and religions all mingled together under Turkish rule, he stumbles on the sites of ancient theatres, on carved blocks of marble covered with trees and grass, on rock-tombs bearing Greek and other inscriptions, and on many other monuments of a civilisation that has passed away. Ere long, possibly, we shall be able to reconstruct a map of ancient Asia Minor, marking accurately the sites of cities mentioned by the ancient geographers, and now to be identified by their ruins. Were this accomplished, it would add much to our knowledge of the ancient world, and we should be enabled to read the ancient historians with increased interest.

No part of Asia Minor has yet been more accurately or thoroughly explored than that corresponding with the ancient Lycia. This ancient division of Asia Minor included a considerable tract of the southern coast-land, lying east of Caria and south of Phrygia. Originally, as Herodotus tells us, the country was inhabited by the Solymi, called also the Milyans, and the Termilæ, one of the numerous Indo-European nations doubtless by whom in primeval times all Asia Minor westward of the Halys was colonised. The aboriginal Lydians, the Phrygians, the Carians, &c. were all of the same Indo-European stock, and probably spoke dialects or varieties of the same common language; but each nation held itself independent of the others. The mutual relations of this aggregation of small Indo-European nations in Asia Minor were disturbed by the appearance on the western coasts, first of the Pelasgians (of whom in all probability the Trojans were a branch), and afterwards of their valiant sons the Greeks. The earliest Greek settlers in Lycia came, it was said, from Crete under Sarpedon, the brother of Minos; but Lycus, the son of Pandion, king of Athens, having also led a colony thither, the inhabitants took the name of Lycians. The Lycians are mentioned by Homer as one of the nations that figured in the Trojan war as the allies of Priam against the Greeks. The effect of the success of the Greeks in this struggle was to throw open more extensively to Greek emigrants those parts of Asia Minor which they had already begun to colonise. Greek customs, the Greek language, and Greek art, we may suppose, were already to a considerable degree prevalent in Lycia at the time when that country, as we are informed by Herodotus, resisted the arms of the Lydian conqueror Crœsus (B.C. 560). But obliged to succumb not long afterwards with the rest of Asia Minor to the Persian conqueror Cyrus (B.C. 545), Lycia became included in one of the satrapies of the great Persian empire, and was consequently cut off from all intercourse with the Greeks of Europe. Reconquered, however, with the rest of Asia Minor by Alexander the Great (B.C. 330), it again became a portion of the general Greek world. From this date, down to the time of its absorption into the Roman empire, was probably the period of its greatest prosperity. It then numbered about seventy cities of greater or less importance. Among these were—Xanthus, the capital of the country, situated on the rapid Lycian river of that name, about six miles from the sea, and originally, it is said, a Cretan settlement; Kos, Telmessus, Pydna, Pinara; Patara, and Myra, mentioned in the history of the apostle Paul; Antiphellus, Olympus, Limyra, and others. The importance of these cities, and indeed of the whole country, declined under the Romans, and still more under the Byzantine empire; and at length Lycia passed into its present condition under the dominion of the Turks.

Before the exploring expedition of Captain Beaufort in 1811–12, Telmessus was the only Lycian city whose site was known. It had been described by Dr Clarke. The publication by Captain Beaufort in 1818 of the results of his researches first roused public attention to the importance of the Lycian remains. In this work the sites of Patara, Myra, Antiphellus, Olympus, and one or two other cities, were identified and described. A visit paid to Lycia about the same time by the eminent architect Mr Cockerell increased the interest felt in Captain Beaufort's delineations. It was not, however, till the year 1838, when Mr (now Sir) Charles Fellows began his travels in Lycia, that the full value of the monuments of that country was ascertained. During the years 1838–40 that gentleman discovered and fixed the sites of many new cities, including Xanthus, Kos, Pinara, &c. all abounding in remains. His own representations, and those of one or two leading men connected with the British Museum, induced government to send out a vessel to bring away such specimens of these remains as could be most easily obtained. The *Beacon*, under the command of Captain Graves, was selected for the purpose, and arrived off Lycia late in 1841, having Mr Fellows on board, to point out the monuments that were to be carried away. These were all from the site of Xanthus; nor was it without difficulty that our ambassador at Constantinople had obtained the permission of the Porte to remove even these. By the labours of Mr Fellows, assisted by the crew of the *Beacon*, during the months of January and February 1842, a great number of the most interesting of the Xanthian sculptures were packed up and prepared for removal. They were not brought to England, however, till late in 1842, the *Beacon* having been found unfit for the purpose. During the interval between the departure of the *Beacon* from Lycia, and the arrival there of the ships that were to serve as her substitutes, the discoveries that had been begun by Mr Fellows were prosecuted by Lieutenant Spratt and Mr Edward Forbes, who were attached—the former as assistant-surveyor, and the latter as naturalist—to the *Beacon*, and who had been left behind by Captain Graves at their own request. These two gentlemen, in company with a private traveller, the Rev. Mr Daniell, explored many new parts of Lycia, and ascertained the sites of eighteen cities in addition to those previously known. Various packages of remains have been subsequently brought from Lycia under the directions of Sir Charles Fellows; and these, together with the original importation, now form the so-called Xanthian Marbles of the British Museum. These marbles, therefore, are in reality but a few sculptures chiefly from the site of *one* of the cities of ancient Lycia. Regarding this city little is known, except that it stood on a rocky and precipitous hill rising abruptly from an alluvial plain, and washed by the rapid torrent of the Xanthus; and that, after existing for many centuries, it was taken and sacked, after a most desperate resistance, by Brutus during the war that followed Cæsar's death. Of the buildings that once covered the top and the slopes of the eminence, fragments still remain intermingled with the ruins of later times—some still visible above ground, others buried. From among these Sir Charles Fellows selected such as he deemed of greatest value.

On entering the Lycian Room, the visitor sees immediately before him (No. 1) perhaps the most interesting of all the Lycian sculptures —the bas-reliefs of the so-called Harpy Tomb of Xanthus. This monument had particularly attracted the attention of Sir Charles Fellows during his first visit to the city. It stood on the Acropolis, or highest part of the eminence, near the ruins of the theatre. 'It consisted,' says Sir Charles Fellows, 'of a square shaft in one block, weighing about eighty tons; its height 17 feet, placed upon a base rising on one side six feet from the ground, on the other but little above the present level of the earth. Around the sides of the top of the shaft were ranged bas-reliefs in white marble, about 3 feet 3 inches high; upon these rested a capstone, apparently a series of stones, one projecting over the other; but these are cut in one block, probably fifteen or twenty tons in weight. Within the top of the shaft was hollowed out a chamber, which, with the bas-relief sides, was 7 feet 6 inches high, and 7 feet square. This singular chamber had probably been, in the early ages of Christianity, the cell of an anchorite, perhaps a disciple of Simeon Stylites, whose name was derived from his habitation, which, I believe, we have generally translated as meaning a column, but which was more probably a *stele* like this. The traces of the religious paintings and monograms of this holy man still remain upon the backs of the marble of the bas-reliefs.'* To assist the visitor in conceiving the shape of the monument, and the position of the bas-reliefs at the top, a model of it is placed in the room beside it. 'The monument,' says the authorised catalogue, 'was never finished, the projection for raising the shaft still remaining, and the shaft having been polished only half-way up. Its base was shaken probably by one of those earthquakes by which the country is known to have been visited, and two of the slabs on the western side were thrown on the ground.' At what time the monument was erected, or for what precise purpose, it is impossible to say. Its size and evident importance, however, render it probable that it was erected to the memory of some royal or heroic personage; while the purely Greek nature of the bas-reliefs shows that it must have been executed at a time when Greek mythology was prevalent, and to suit the taste of a people who believed in it. 'Various conjectural explanations of the sculptures,' says the catalogue, 'have been proposed. The scene on the west side has been supposed to represent Hera or Juno seated, and holding a cup before the sacred cow of Io and Epaphus, Aphrodite, and the three Charities or Graces; others consider that the two seated figures represent Demeter (Ceres) and Kora (Proserpine), and the group between them the three Horæ or Seasons, or the Erinnyes or Furies. Three different explanations have been proposed of the scene on the east side:—1. Tantalus bringing to Pandarus in Lycia the golden dog stolen from Crete: 2. Asclepios (Æsculapius) the seated figure—in front, Telesphorus, or Ganymedes and Artemas; behind him, Charis and Petho, two of the Graces: 3. Neptune seated, before him a boy offering a cock, and a man leaning on a staff; behind him, Amphitrite and Amymone. On the north side, at the corners, are two Harpies flying away with two of the daughters of Pandarus, having been sent for that purpose by Zeus, to avenge the theft and perjury of their father; a third daughter, Aedon, who was saved from destruction, is represented fallen on her knees, and deploring the fate of her sisters. On this side also is a seated divinity, conjectured to be Zeus or Pluto, under whose chair is an animal, either a bear or a boar; before him stands an armed man; they hold a helmet between them. On the south side, at the corners, are the two Harpies bearing off two of the daughters of Pandarus. In the centre is a divinity, supposed to be Zeus, and a female offering a dove, perhaps Aphrodite.' From this somewhat confusing description, all that can be clearly inferred is this, that the designer of the monument, being a Greek, and probably a Greek of Lycia, employed for the decorations of the monuments some of the ordinary legends of the Greek mythology, giving preference, however, to such as were peculiarly Lycian and local, and, above all, to the celebrated legend of the daughters of Pandarus. It is curious to think of the Christian anchorite living in a cell the very walls of which were sculptures representative of the pagan mythology that had been superseded by the religion of which he was a devotee!

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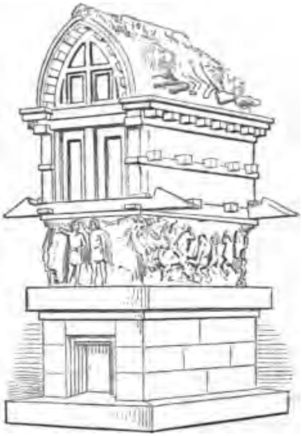
*The Xanthian Marbles, their Acquisition, &c. By Sir C. Fellows. London: 1843.

Side by side with the bas-reliefs from the Harpy Tomb is a complete massive monument (No. 142), called by Sir Charles Fellows 'The Horse Tomb,' because horses are represented in the sculptures it bears, but designated in the catalogue more properly as the Tomb of a Persian satrap of Lycia named Paiafa. This monument, which was situated on a part of the hill farther from the river than that on which the Harpy Tomb stood, is of very large size, and had to be broken in pieces before it could be removed; it is now, however, pieced together again. 'It resembles,' says the synopsis, 'a wooden coffer or roofed house, with beams issuing forth at the sides, the upper part roofed with an arch resembling the early Gothic. A groove in the ridge surmounting the arch was probably for the insertion of a bull's head of some other material, these tombs being represented so decorated in the Lycian rock sculptures. On each side of the roof is an armed figure, perhaps Glaucus or Sarpedon, in a chariot of four horses; and along the ridge a combat of warriors on horseback, and a Lycian inscription, recording that the tomb was made by Paiafa; at the east side are two naked figures and sphinxes; at the west two sphinxes, and a small door for introducing the corpse. On the north side, below, is a combat of warriors on foot and horseback, and the satrap Paiafa seated, attended by four figures. On the east side other figures of men or gods, and an inscription, recording that the tomb was made by Paiafa. On each side of the roof are two waterspouts in the form of a lion's head.' The date of this monument is fixed by the fact, that it was erected by a Persian satrap, the dominion of the Persians in Lycia extending from B.C. 545, when the country was conquered by Harpagus, the lieutenant of Cyrus, to B.C. 330, when Asia Minor was again recovered by Greek arms under Alexander the Great. The Persian satrap Paiafa must evidently have lived some time during that period. A great proportion of the Lycian monuments seem to have been then erected, particularly those bearing, as this does, inscriptions in the peculiar language called Lycian. Regarding this language and its probable origin a few words must here be inserted.



Paiafa's Tomb.

As in the cases of the monuments of Egypt and Assyria, so in that of the monuments of Lycia, a great number of them bear inscriptions either of a historical or a mythological character. Innumerable such inscriptions have been found by travellers in Lycia on the sites of ancient Lycian cities—some on scattered blocks of stone that evidently belonged to buildings, some in the interior chambers of rock-tombs, some on the exterior of pillars and ordinary sepulchral monuments. Many of these inscriptions are in the Greek language, and all such can of course be easily read and understood. Such is the inscription on No. 176, and others in the room. Hundreds of such inscriptions, of which much use might be made, were copied by Messrs Spratt and Forbes. One, carved, or rather notched, on the wall of a rock-tomb at Myra, was simply to this effect:—'Moschus loves Philiste the daughter of Demetrius.' It evidently did not belong to the monument, but had been scratched on it by the lover, Moschus, some day as he was passing it. Curious record to have been preserved two thousand years! Many inscriptions, however, are not in the Greek language, but in one totally different, and, so far as scholars yet know, not found anywhere else, except on the ancient monuments in this part of Asia Minor. In this language the character used is not Greek, but a sort of combination of Greek letters with letters derived from a different source, and the words are evidently quite foreign. No. 156* is a specimen of an inscription in this unknown, or, as it is called, Lycian language. The interpretation of this defunct Lycian language would probably have proved quite hopeless but for the fortunate circumstance that, besides inscriptions in it, and inscriptions in Greek, numerous inscriptions have been found containing sentences written *both in Lycian and Greek*. Nos. 155 and 156 are examples of such bilingual inscriptions; the former is from a tomb at Telmessus, the other from a tomb at Antiphallus. By deciphering these bilingual inscriptions, and carefully identifying particular words in the Lycian with particular words in the Greek, scholars have actually been able, as it were, to revive and repronounce small fragments of the extinct Lycian; and there is little doubt that farther progress will yet be made in the same study, the interpretation of the Lycian not presenting difficulties nearly so great as that of the arrow-headed character. The following example of a bilingual inscription in Lycian and Greek we take from a 'Dissertation on Lycian Inscriptions,' by Daniel Sharpe, Esq., appended to the Travels of Messrs Spratt and Forbes, only printing the Lycian portion in ordinary letters instead of the original Lycian. The inscription is from a tomb at the site of the ancient Limyra:—

LYCIAN.

Eweeya crafazeya mete prinafatu sedereya pen . . . neu tedeeme urppe etle euwe se lade euwe se tedeeme p . . . e . . . leye.

GREEK.

Το μνημα τοδε εποιησατο Σιδαριος Ραρμενοντος υἱος ἑαυτῳ και τῃ γυναικι και υἱῳ Πυβιαλῃ.

ENGLISH.

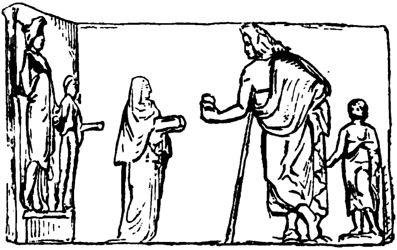
This tomb made Sidarios, Parmeno's son, for himself, and his wife, and son Pubiale.

The Greek in this case appears to be a literal translation of the Lycian.

The question naturally arises—What was the origin of the Lycian language?—who spoke it?—who introduced it into the country? Two opinions may be maintained on this point — either that it was the language spoken by the descendants of the aboriginal Solymi or Milyans, that Indo-European race who occupied the country when it was first colonised by the Greeks; or that it was the language spoken by the Persian invaders who occupied the country from B.C. 545 to B.C. 330. The second is by far the more likely supposition; and if so, then the question of the nature of the Lycian language merges itself in the larger question relative to the origin and civilisation of the ancient Asiatic races, which, under the name of Persians, were led by Cyrus to the conquest of the west. During the period of their dominance in Lycia, these invaders would naturally impress their own character and tastes on the country; hence probably the foreign style of some of the monuments now found in it. Even then, however, they would have had to employ Greek artists; and as the country ultimately relapsed under Greek rule, the pervading style in the whole series of Lycian monuments is discernibly Greek. Inscriptions in the language of the invaders, cut by sculptors of the conquered race, and a few quaintly-shaped tombs of native Persian designs—these were probably the only monuments that finally remained in Lycia of the government of the satraps. A few years after the victories of Alexander, the country must have been thoroughly Hellenised again.

Near the 'Horse Tomb' is a cast of a *stele* or obelisk, that formed part of one of the peculiarly Lycian (that is, Persian) monuments found at Xanthus. 'It is covered on the four sides with a long inscription in the language of the ancient Lycians (Persian invaders), in which there is mention made of the son of Harpagus, and several Lycian towns and states: on the north side is a Greek inscription of twelve hexameter lines, which, commencing with the first line of one of the epigrams of the poet Simonides, who flourished B.C. 556, records the warlike exploits of the son of Harpagus, and that this column was erected in consequence in the agora or market-place of the twelve gods.' If the supposition is correct, that the so-called Lycian language and character were introduced into Lycia by the Persian invaders, then this curious monument is undoubtedly among the most ancient of all the remains bearing Lycian inscriptions; for the Harpagus mentioned on it was the famous lieutenant of Cyrus, whose exploits are recorded by Herodotus, and who first led the Persian armies into this part of Asia Minor. Erected, as we may conclude, between the year B.C. 530 and the year B.C. 500, to commemorate the actions of the son of this Harpagus, the stele was properly a Persian monument, one of the earliest of the kind raised in the country; the Lycian portions of the inscription being intended doubtless for Persian eyes, while the Greek verses, with the quotation from Simonides, were an equivocal compliment to the conquered people—just as the Normans, to commemorate some of their earliest transactions in England, might have erected a monument bearing not only a long inscription in Norman French, but also some Saxon verses.

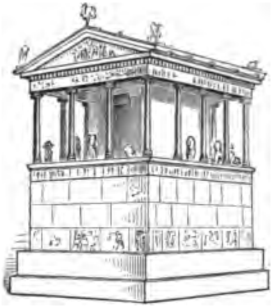
The Lycian Room contains many other objects of individual interest which the visitor will discover for himself. The most worthy of remark are the plaster-casts of sculptures found in the interior of the Lycian rock-tombs. Nos. 150–152 are casts from the sculptures of a rock-tomb at Cadyanda. 'They are exceedingly interesting,' says the synopsis, 'from bilingual inscriptions in the Greek and Lycian languages which accompany the figures. No. 150, from the panel of the door, represents a person called Salas, standing, holding an *œnochoë*, or wine-cup; No. 151, females conversing, one of whom is named Mesos; and the nursing of a child; No. 152, an entertainment: on the first couch to the right recline Endys and Seskos: in the next, Molos, or Molas, and Kparmos, and two seated children—one named Hecatomnas: under these couches are dogs: in the next couch reclines a female named Sipho, to whom a child, Porlaps, stretches out its arms from the next couch, in which are Salas and the female named Mesos; beyond these is Eidas, the son of Salas, and two servants, one playing the *diaulos* or double-flute: on the extreme right is a naked figure named Hecatomnas.' The tomb from which these sculptures are taken was evidently that of some Lycian family of Greek descent that lived at Cadyanda during the period of Persian rule, when the Persian colonists had become in a manner incorporated with the original Greek population. Of later date, and therefore more exclusively Greek, are the sculptures of a rock-tomb at Myra, of which No. 166 is a plaster-cast, coloured to represent its present condition. 'On the exterior is a standing male figure, apparently a divinity, and on the right hand of it a young man attended by a boy, leaning on a staff, offering a fruit or flower to a veiled female, attended by two other females, one of whom holds a pyxis; on one of the interior walls is a reposing bearded figure, probably Dionysos or Pluto, holding a rhyton in the right, and a cup in the left hand, on whom attends a boy with wine; on the other interior wall, a seated veiled female, probably Proserpine or Aphrodite, draped by a female attendant, Petho, and having before her a naked youth, Eros, holding a lecythus and strigil.' To understand the full significance of such tomb-sculptures, one would require to know more than it is possible for us now ever to know regarding the peculiar portions of their mythology which the ancients connected with their views of death. Almost all the civilised nations of antiquity were accustomed to decorate the walls of their tombs with paintings and sculptures; and an examination of the ancient tombs of Egypt, Etruria, &c. proves how various were the subjects deemed proper for such representations; still one is apt to think that when the subject was mythological, the artist must necessarily have been guided in his selection by some principle—not representing any god or legend that he pleased, but confining himself to a certain class of legends.



Rock-Tomb at Myra.

We have still, however, to notice the most important part of the contents of the Lycian Room—namely, the long series of objects from No. 34 to No. 140 inclusive, constituting about two-thirds of the entire collection.

We have mentioned that on the sites of the ancient Lycian cities are still found masses or buried groups of ruins that evidently once formed theatres, temples, or other such edifices. One such mass or group of ruins attracted the notice of Sir Charles Fellows at Xanthus, and he determined to examine it thoroughly, so as not only to be able to reconstruct in fancy the whole building as it once stood, but also, if possible, to collect for removal all, or at least the greater part, of the separate fragments. He succeeded in his object. Deposited in the Lycian Room is a small model presented by him to the museum, representing the building as it originally stood. Along with this model is a ground-plan exhibiting the position of the remains as they lay scattered about; while, to make the whole more intelligible, there is also a picture of the scene of the discovery—the actual Lycian landscape, of which the mass of ruins formed a feature. *Now the series of marbles from No. 34 to No. 140 inclusive, is nothing else than the most important remaining fragments of this Xanthian building;* and hence before the visitor looks at them, he should carefully examine the restored model, as it is only by doing so that he can succeed in imagining the fragments restored each to its proper position. As in the geological portion of the museum there are heaps of bones forming the separate fragments of one extinct animal, precisely so are these separate stones the remains of one ancient building.



Model of Xanthian Building.

The model represents the building as having been a peristyle edifice of the Ionic order of Greek architecture, with fourteen columns surrounding a solid interior cell; the whole placed on a massive base standing on two steps. The dimensions of the original building were as follows:—Height from the top of the pediment to the base, 35 feet 9 inches; height of base, 12 feet 9 inches; height of columns, 10 feet 5 inches; height of pediment, 3 feet 1½ inches; breadth of base, 20 feet; length of base, 28 feet; breadth of interior cell, 9 feet; length of ditto, 15 feet. The building was decorated with four distinct sculptured friezes—namely, a frieze 3 feet 4 inches broad, running round the bottom of the base; another 2 feet broad, running round the upper part of the base; a third 1 foot 6 inches broad, running round the exterior of the building just above the columns; and a fourth of the same breadth, running round the upper part of the interior cell. In the intercolumniations—that is, in the spaces between the columns—there stood statues; and stone figures appear also to have been placed on the top of the edifice, at the apex and the two corners. For what purpose, or at what exact period this beautiful little building was erected, is not known. 'By some,' says the synopsis, 'it has been considered as a trophy in memory of the conquest of Lycia by the Persians under Harpagus, B.C. 545, and probably erected about B.C. 476; by others the sculptures have been placed as late as B.C. 450–395. Another conjecture is, that their subject represents the suppression by the Persian satrap of Lycia of the revolt of the Cilicians against the Persians, B.C. 387.' In any case, however, the monument is clearly a work of Greek art. The various fragments of it now in the museum are arranged as follows, each separate fragment being numbered with the same figure that is marked on the part of the model to which it ought to be referred:—

Nos. 34–49 are the slabs that formed the broader frieze running round the bottom of the base. 'They represent,' says the synopsis, 'a series of contests between warriors armed in the Greek manner with helmets, crests, and Argolic bucklers, *thoraces*, and greaves, and others more lightly armed, some being only in tunics, or naked, and wearing only helmets; horsemen, &c.' The execution of these sculptures is tolerably spirited.

Nos. 50–68 are the slabs of the narrower frieze running round the upper part of the base. 'On Nos. 50, 51, 52, and 53 is seen the attack of the main-gate of a city, supposed to be Xanthus; this gate is defended by a low flanking tower with windows; the besiegers have planted a scaling-ladder, which two warriors are supposed to be holding on securely with ropes. Three hoplites (heavy-armed men) having taken off their sandals, are seen mounting the ladder, a fourth has already marched into the tower; the other troops, called on by their officers, advance rapidly to the attack. Nos. 55, 56, 57, 58, and 59 represent a general combat between Greeks, some armed as hoplites, and others wearing long tunics. Nos. 60 and 61, a walled city with its buildings, within which are tombs and temples, and the heads of the besieged looking over the battlements. On No. 62 is a Persian satrap or monarch seated, supposed to be Harpagus, attended by his guards and a slave holding over his head an umbrella, the emblem of sovereignty, receiving a deputation of two elders from the besieged city. Nos. 65 and 66 represent a sally from the town; the garrison appear on the walls, while the women throw up their arms, shrieking in despair. No. 67 is supposed to be the retreat of the defeated Lycians into the city.' The whole of this series of sculptures is extremely interesting, and the supposition that it represents the siege of Xanthus by the Persian Harpagus does not appear improbable.

Nos. 95–105 are the slabs of the narrow frieze running round the enclosed *cella* of the building. The subject is a feast; the guests are reclining upon couches, served with wine, and attended by female singers and musicians. There is also a sacrifice of rams, bulls, and goats.

Nos. 110–123 are the slabs of the narrow frieze running round the exterior of the main building, just above the pillars. They represent presents of dresses, horses, &c. brought to a satrap; the hunt of the bear and the wild boar; and a battle of horsemen and foot-soldiers.

The remaining sculptures—namely, Nos. 69-94, 106–109, and

124–140—are fragments of the same building taken from other parts than the friezes. Thus Nos. 70–74 are columns or portions of columns; Nos. 106–109 are lacunaria, or coffers of the ceiling, with architectural details painted on them; No. 124 is a moulding from the north corner of the eastern pediment; No. 125 is the eastern pediment itself, with sculptures executed in relief, representing male and female figures—probably divinities—seated, and others standing, &c. The marbles, however, most attractive to the eye of all the fragments of this ancient Xanthian building are Nos. 75–84 and Nos. 139, 140, the former being portions more or less complete of statues of draped females, and the latter being statues of two crouching lions. These statues probably stood, with others of the same kind, in the intercolumniations of the building. They are admirably executed, and may fairly be compared with some of the more famous relics of Greek sculpture that occupy other apartments in the museum. The visitor is sure to be arrested in particular by the female statues. Their attitude is that of nymphs or goddesses borne rapidly through the air, their garments blown about their bodies and limbs; and that their passage is over the sea, is suggested by the marine emblems—the dolphin, the eel, the crab, &c.—that are placed at their feet. The sculptor appears to have embodied his conception most successfully in the statue marked No. 81, the execution of which, and especially the action of the almost transparent drapery, is very beautiful. The figures, says the synopsis, are supposed to have reference to the legend of the arrival of Latona with her children Artemes and Apollo at Xanthus, or to the naval victory over Evagoras. Neither meaning, however, is very clearly expressed, and the visitor will do best to content himself with the simple fact, that the statues represent divine nymphs borne swiftly through the sea-wind towards some distant shore.*

THE ELGIN SALOON.

The sculptures in this saloon are chiefly from the site of ancient Athens, and are consequently among the most interesting of all the Greek remains that have survived to our times. Before describing them, it may be necessary to give a brief sketch of the history and general appearance of the famous city of which they once formed an insignificant part.

Attica, the country of which Athens was the capital, was one of the numerous separate states into which Greece had, from time immemorial, been divided. In size it did not exceed one of the smaller English counties; in shape it was a triangle, bounded on two sides by the sea, and separated on the third by a chain of mountains from the adjacent state of Bœotia. The soil is upon the whole barren, but the climate and position are good. Several masses of mountains occur in the interior, and diversify the surface; and in one of these, anciently called the Pentelicus, are quarries of excellent white marble. Excepting these mountains, the whole of Attica may be said to consist of three great plains—the Eleusinian plain farthest to the west; the Cephesian plain in the middle; and the Mesogæan plain on the east. It was in the second of these plains, between two small streams—the Ilissus and the Cephisus—and at a distance of about five miles from the sea, that Athens was situated. The city must have been in existence fourteen or fifteen centuries before Christ—one of many little towns or villages that dotted the surface of Attica. According to the native legend, its founder was a hero named Cecrops, either of Greek or Egyptian birth; after him a long line of kings ruled over it, some of greater, and some of less celebrity. The third in descent from Cecrops was Erectheus I., or Erichthonius, a divine man, whose memory was afterwards held sacred. But the greatest of all these early kings was Theseus, the ninth after Cecrops, and the contemporary and friend of Hercules. To this, their favourite legendary hero, the Athenians, besides many marvellous exploits against bulls, Amazons, centaurs, &c. ascribed the honour of having consolidated all Attica into one political whole under the supremacy of Athens—an achievement which he had ordered to be commemorated in all time coming by a great five-yearly festival, to be called the *Panathenæa*, or 'Festival of all the Athenians.' It was during the reign of his successor Menestheus that the Trojan war took place; and according to Homer, the Athenians contributed fifty ships to that expedition. With Codrus, the seventeenth king of Athens, the monarchical form of government ceased (B.C. 1068); and the executive power was intrusted to officers called archons, appointed at first for life, but afterwards for a limited term. A farther change ultimately introduced was the division of the archonship among nine colleagues. One of the archons was the famous Solon, who lived about B.C. 594, and who spent his life in remodelling the whole legislative, judicial, and social system of his native state. By the constitution of Solon the whole free community of Attica was divided into four tribes or classes, according to the amount of their property; the archons and other public officers were to be chosen from the richer classes; but as every citizen was to have a right to take part in the *ecclesia*, or general assembly of the people, the government was virtually to be a democracy. In addition to the ecclesia, Solon established a senate, or *Boulé*, to consist of four hundred members, one hundred from each tribe.

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* In connection with the subject of Lycia and its remains, see Sir Charles Fellows's 'Journals of Journeys in Asia Minor,' his pamphlet on the Xanthian Marbles, and the 'Travels in Lycia' of Messrs Spratt and Forbes.

It is from the period of Solon that authentic Athenian history may be said to commence, though there is little doubt that before his time the Athenians were one of the leading commercial nations of the Ægean. The democratic constitution of Solon was for some time placed in abeyance by the usurpation of Pisistratus (B.C. 560), an able Athenian, who wielded the supreme power in Attica during nearly his whole life. His son and successor Hippias, however, was expelled by the Athenians (B.C. 510); and for some time the city was the scene of a vehement struggle between two political parties, the one of aristocratic, the other of democratic tendencies. During this struggle a change was effected in the constitution, the number of tribes being increased to ten, and the number of senators to five hundred—fifty from each tribe. Suddenly, in the midst of their political commotions and their disputes with other Grecian states, particularly the Lacedæmonians and the Bœotians, the Athenians were alarmed by the intelligence that the Persians, on the solicitation of Hippias, the long-expelled tyrant, were about to invade Greece. In the year B.C. 490 the invasion took place; an immense Persian army under the command of Datis and Artaphernes, generals of King Darius, crossed the Ægean, and encamped on the plain of Marathon within the Athenian territory. Against this force there marched a small body of Athenians and Platæans, who, under the generalship of Miltiades, attacked and routed the Persian host. But the Persian war that had thus been begun was not yet brought to a close. In the year B.C. 480 the Persian monarch Xerxes, the successor of Darius, led in person a second expedition against Greece. A vast army slowly advanced through Thrace, Macedonia, and Thessaly, while a fleet of thousands of vessels attended its movements along the coast. Taking the pass of Thermopylæ after a brave defence made by a small body of Spartans, the Persian army marched straight through Bœotia into Attica. The Athenians, by the advice of their general, Themistocles, quitted their city, and took refuge—the fighting-men on board their ships, and the others in the adjacent islands and towns. Meanwhile the Persian fleet had arrived off the small island of Salamis, on the Athenian coast. Here a great sea-battle was fought, in which the Greeks were victorious; Xerxes fled to Asia, leaving the wreck of his forces to retreat by land under the command of his general, Mardonius; and these having been finally defeated at Platæa by the combined Greek troops under Pausanias, the Athenians were able, without fear of further molestation, to resume their ordinary habits. Their city, however, had been laid in ruins by the Persians; and it required many years thoroughly to repair it. The political constitution of the city was likewise changed. By a law of Aristides, passed in the year B.C. 479, every citizen was made eligible to any of the offices of the state; and thus the Athenian government became absolutely, and in the fullest sense, a democracy.

The period intervening between the battle of Platæa (B.C. 479) and the commencement of what is called the Peloponnesian war (B.C. 431) was perhaps the most splendid in Athenian history. Placed, by their conduct during the Persian invasion, at the head of the states of Greece, the Athenians did their utmost to maintain so high a position. Retaliating upon the Persians, they carried their arms into Asia Minor, seized many important situations in that country, and became masters of various of the more valuable islands of the Ægean. Their most distinguished leader in these expeditions was Cimon, the son of Miltiades. Somewhat later in point of time, and even more celebrated as a statesman than as a military leader, was the great Pericles. Joining the democratic party, and opposing with all his might the policy of the more aristocratic party, to which Cimon, and after him Thucydides, belonged, Pericles soon attained an unbounded popularity with the Athenians, which he turned to so good purpose, that during the later years of his life (B.C. 444–430) he was in reality their absolute ruler, frequently resisting and thwarting them when he considered it necessary. The attention of this extraordinary man was directed with almost equal zeal to these three objects—the perfecting of the whole civil and judicial system of his native state; the securing of its political pre-eminence among the nations of Greece; and the fostering within it of all kinds of intellectual and artistic excellence. In all three he alike succeeded. The tragic poets Æschylus, Sophocles, Euripides, the comic poet Aristophanes, the historian Thucydides, the sculptor Phidias, the philosopher Socrates, and many more eminent men that might be named, were contemporaries and fellow-townsmen of Pericles. When we consider that even in its most populous condition the whole of Attica never contained more than 400,000 inhabitants, of whom not more than 120,000 can have been free Athenian citizens, this exuberance of genius in one community must seem almost miraculous. Probably never on the face of the earth did there exist an aggregation of individuals all so highly endowed and so carefully cultured as were the citizens of ancient Athens. Every fourth man amongst them was a man of superior intellect; and all, without exception, pretended to literary taste.

Pericles died in the second year of the Peloponnesian war. This great war, which lasted nearly thirty years (B.C. 431–404), was a struggle between the Athenians and the Lacedæmonians for the supremacy in Greece. Each nation had its allies among the other Greek states. Carried on on both sides with great valour and ability—by the Athenians under Nicias, Alcibiades, Conon, and other generals, and by the Lacedæmonians under various commanders, of whom the most eminent was Lysander—the war terminated in the victory of the Lacedæmonians. Athens surrendered to the conquerors; its fortifications were destroyed, and its liberties violated. For the democratic government that had long prevailed was substituted a government by thirty irresponsible individuals, nominated by the Spartans, and called the Thirty Tyrants. Their power, however, was overthrown by a patriot named Thrasybulus after it had lasted eight months; constitutional forms were restored; and the Athenians, though they did not recover their former supremacy, were able once more to defy the Lacedæmonians, and send their ships abroad over the Ægean. To the period of comparative tranquillity which ensued belong Plato, Xenophon, and other eminent Athenian names. It was during this period that the Thebans or Bœotians, under their leaders Pelopidas and Epaminondas, made their brief attempt to rise to that position of pre-eminence in Greece that had already been held by the Athenians and the Spartans. All three, however, were obliged to succumb to a stronger power that now appeared in the field—that of the Macedonians, who, under their king, Philip, began to play an important part in the affairs of Greece. After a powerful struggle against the encroachments of this monarch—a struggle of which the animating spirit was the orator Demosthenes—the Athenians and Thebans were defeated (B.C. 338), and the supremacy of Philip was established. This supremacy he bequeathed (B.C. 336) to his son Alexander the Great, to whose conquering armies the Athenians contributed but a small contingent.

Attached, after the death of Alexander, to the Græco-Macedonian portion of his divided empire, the Athenians dragged on a degraded existence under Macedonian governors, till the conquest of the Macedonians by the Romans (B.C. 143) gave them a new master. Under the Romans Athens was highly favoured; her ancient reputation protecting her from the insults and depredations with which other provincial cities were visited. In the time of Cicero, and for a long period after, it was customary to send young Romans to Athens to complete their education. Of all the emperors, Hadrian (A.D. 117–138) was the greatest benefactor of Athens; under him the city was restored to a state of splendour almost vying with that which it had exhibited in the days of Pericles. Following the fate of the empire under the successors of Hadrian, Athens, with the rest of Greece, became part of the empire of the East; and at length, after various revolutions, fell into the hands of the Turks (B.C. 1456). Under their power it continued till a few years ago, when, by the help of the European powers, Greece was taken from the Turks, and constituted a separate kingdom. Athens then became the capital of the new European state.

The celebrated city whose fortunes we have thus hastily sketched must have originally been but a small fortified hamlet, or collection of buildings, situated on the insulated hill or rock called afterwards the *Acropolis*, or 'Higher City.' This rocky eminence, which is the first thing that strikes the eye of the traveller as he approaches the site of Athens, and which is a conspicuous feature in all the drawings or engravings of the city, is 'about 150 feet in height; and in length, upon its surface, which is nearly level, from 900 to 1000 feet; whilst its sides are everywhere a precipice, the western extremity alone excepted.' Perched on this steep rock, the little village of Cecropia, as Athens is said to have been originally called, looked down upon the Athenian plain, with the Ilissus and the Cephisus flowing through it. But as the population increased, the rock became too narrow, and houses were scattered round its base or on neighbouring eminences, extending to some distance on all sides, and at length surrounded by a wall. Then arose the distinction between the Acropolis or Higher City, and the Catapolis or Lower City. The former was fortified as the citadel, and was naturally appropriated to such buildings as were considered of greatest importance. Here, indeed, from time immemorial, had stood the Erectheum, or shrine of Athene Polias (Minerva of the city), the guardian deity of the Athenians; and hither offerings had been brought from all parts of Attica to the famous statue of the goddess, which, according to the legend, had fallen from the skies in the reign of the mythical King Erectheus. In this temple, which consisted of two, or, possibly, of three compartments, each with a special name, were also contained two other sacred symbols—an olive-tree and a cistern of brackish water, left there, as was said, by Minerva and Neptune, to commemorate their dispute respecting the guardianship of the city. Other buildings also, besides the Erectheum, or Temple of Minerva Polias, stood on the Acropolis. Beneath, in the lower city, were numerous edifices of importance, some close at the foot of the Acropolis, others at some distance. Of these, the oldest were—a magnificent temple of the Olympian Jupiter, which was not finished till long afterwards; one of Apollo, called the Pythium; one of the goddess Ge (the earth); and one of Dionysus, or Bacchus—all situated on the south side of the Acropolis. Of the other temples and public edifices that must have adorned Athens as early as the days of Solon and Pisistratus, we have no special account. The walls at this time closely surrounded the city itself; and there was no fortification connecting the city with either of its three harbours —the Phalerum, the Munychia, and the Peiræus.

The Persian invasion (B.C. 480) was a memorable epoch in the history of the city. The invaders had levelled the walls, and destroyed or injured all the great buildings; and hence, as soon as they had retired, a new Athens had to be raised on the foundations of the old. 'The new buildings,' says Colonel Leake, 'which rose at Athens in the half-century of her highest renown and riches (B.C. 480–430), may be divided into those erected under the administrations of Themistocles, of Cimon, and of Pericles.' Such as were raised by Themistocles seem to have had utility for their sole object. Thus he applied the ruins of the temple of Minerva on the Acropolis to the repair of the Acropolis walls; for the walls of the city itself he appropriated the materials of other ruined buildings; and the only great new works that he planned—namely, the fortification of the Peiræus, and the connection of the city with that part by a double wall five miles long—were intended solely for the purpose of defence. These necessary works, however, having been attended to in the first place, there was time afterwards to think of others more decorative in their character. Accordingly, Cimon, who was a man of wealth and taste, not only superintended the execution of the fortifications begun by Themistocles, but effected, partly at his own expense, many architectural improvements in the city itself. To this distinguished Athenian are to be attributed, in particular, the Theseium, or Temple of Theseus, built on an elevated site on the lower city to the west of the Acropolis; the Pœcile, or Painted Piazza, a building devoted to historical pictures, situated between the Theseium and the Acropolis; and the commencement, at least of the Dionysiac Theatre, or Theatre of Bacchus, built close at the foot of the Acropolis, and intended for the representation of the dramas of the great tragedian Æschylus.

The material used in these buildings was the native Athenian or Pentelic marble, brought ready cut from the quarries, distant about four hours' journey from the city; for some of the statues and decorations other materials were used. Under the government of Pericles, not only were the buildings that had been commenced by Themistocles and Cimon completed, but others even more splendid were undertaken. The Erectheum on the Acropolis, which had been greatly damaged by the Persians, was renovated; several new stoæ or piazzas were built in the Ceramicus or north-western quarter of the city; in different parts of Attica, temples that had lain in ruins for many years were restored; and at Eleusis, a town a few miles to the west of Athens, celebrated as the seat of the mystical worship of Demeter or Ceres, a magnificent temple was constructed for that goddess. But the edifices that did most honour to the taste and munificence of Pericles were the Propylæa and the Parthenon. The Propylæa was the columned gateway or architectural facing of the Acropolis on the west side—on which side alone was there an access to it from the lower city; this access being by a long flight of stone steps rising from the hollow between the Acropolis and the adjacent eminence called the Areopagus. The Parthenon was a new temple of Minerva, the virgin goddess (the Greek word *Parthenos* means virgin), erected on the Acropolis, not far from the Erectheum. On this noble edifice of Pentelic marble, the finest of all the temples of antiquity, Pericles spared no pains. That it might be as perfect as possible, all the most celebrated artists of the day were employed upon it. The architects were Calliciates and Ictinus; the former being probably the mere builder or contractor, and the latter, who was famous as an architect over all Greece, and who, moreover, left an architectural treatise on this very edifice, the real designer. But the superintendent of the whole, as Plutarch tells us, was the great sculptor Phidias, the personal friend of Pericles. By him, or at least under his immediate care, were executed the numerous sculptures that adorned the building; and perhaps his greatest work, after the Olympian Jupiter at Elis, was the chryselephantine statue of Minerva, that stood in the interior shrine. This statue was nearly 40 feet high; it represented the goddess standing, having on a helmet crowned with a sphinx, with drapery falling round her body, and holding in one hand a spear, and in the other a figure of Victory, while at her feet lay a shield. The naked parts of the body were of ivory, the eyes of precious stones, and the drapery of gold, of which material there was employed a quantity amounting to forty-four talents, or £120,000 in value. By the advice of Pericles, who knew the suspicious character of the Athenians, the drapery was so adjusted that it could be taken off and weighed without injuring the statue—a precaution which did not prove useless. On the convex side of the shield, which lay on the ground, and on which were sculptured the battle of the Greeks and Amazons, Phidias introduced his own portrait and that of Pericles—a liberty which the Athenians highly resented. He represented himself as an old bald-headed man heaving a large stone.

Athens, left by Pericles a beautiful city, did not suffer much from the issue of the Peloponnesian war. The walls, indeed, particularly those of the Peiræus, and the long walls joining that part with the city, were partially demolished by the orders of the Spartans; but the edifices of the Acropolis and those of the lower city, stretching away almost to the Peiræus, were left untouched. Even the walls themselves did not lie long in ruins, having been rebuilt by Cimon, B.C. 393. It was not, however, till about seventy or eighty years after Pericles—that is, about the time of Demosthenes—that new architectural improvements of great moment were undertaken. Then a well-known citizen and political leader named Lycurgus, who had been appointed commissioner of public works, built or began various new edifices. Of these the chief were—a stadium or amphitheatre for the Panathenæic games, situated on the east bank of the Ilissus, and described as of vast dimensions; and a gymnasium or school of exercise, erected in the part of the city called the Lyceum. He also finished the Dionysiac theatre, which had been begun by Cimon. At his death, which took place B.C. 328, when Alexander was master of Greece, Athens may be considered to have attained its greatest extent. Under the Macedonians and the Romans it must have declined in size, and many of its finest buildings must have fallen into decay. As has already been mentioned, however, it had a period of revived grandeur under the Emperor Hadrian (A.D. 117–138). One of the many edifices added to Athens by this emperor was a great stoa or piazza of 120 columns of Phrygian stone, containing apartments decorated with paintings and statues, and provided with books for the accommodation of the public. He also commenced a great aqueduct from the Cephisus. After Hadrian in the list of decorators of Athens, comes Herodes Atticus, a rich and learned Athenian of the times of Antoninus Pius. He completed the Stadium of Lycurgus, and erected several new buildings, of which the chief was an Odeon, or music theatre, called by him the Theatre of Regilla, in memory of his deceased wife, whose name was Regilla. After the time of Herodes no new edifices of importance seem to have been erected in Athens, and the city gradually dwindled and decayed. When Christianity was authoritatively introduced into Greece (A. D. 420), many of the pagan temples at Athens, or at other places, were converted into Christian churches; and in effecting this change, numerous statues and sculptures were doubtless destroyed. Much damage was also done to the ancient monuments. After the city came into the possession of the Turks (A.D. 1456), and during the siege of the city by the Venetians (A.D. 1687), some buildings that had till then survived almost entire, were laid in ruins by the shells and shot. On this occasion the Parthenon, from its exposed position, particularly suffered.

After the revival of learning in Europe, the attention of scholars was naturally directed to Athenian antiquities, and it was with great joy that they learned, from the reports of travellers, that the city, which they had supposed totally destroyed, still contained relics of its former greatness. It was not till the year 1674, however, that any real attempt was made to figure or describe these. In that year a number of drawings from the sculptures of the Parthenon were made by a French artist, Jaques Carrey, under the direction of the Marquis de Nointel. These drawings are still preserved in the Royal Library at Paris, and there are copies of them in the British Museum. Though of very rough execution, they are particularly valuable, as having been made before the siege of the city by the Venetians, and at a time when the edifice was all but entire. For the same reason an account of the Parthenon by two Englishmen, Sir George Whaler and Dr Spon, who visited it in 1676, is still very interesting. By means of the two together, the position and original appearance of many pieces of sculpture that have since been either lost or damaged may even yet be ascertained. It is impossible to say how much of ancient Athens that was still standing when Carrey, Whaler, and Spon visited it, has since perished; but in all probability the proportion is considerable, for the Turks of the neighbourhood appear never to have reopened the ancient Pentelic quarry, but to have used, without scruple for building material, the masses of marble blocks that they found lying about them on the site of the city itself. It was the practice of the Turkish boys, it is also said, to amuse themselves by firing or throwing stones at projecting pieces of sculpture in any convenient situation.

In the year 1799 Lord Elgin was appointed English ambassador at the court of Constantinople. Before his lordship set out, Mr Harrison, an architect who had been employed by him in Scotland, suggested that he should use the opportunities his position would give him to take casts of some of the Athenian sculptures, as yet known to the public only by description. Lord Elgin mentioned the matter to government, but received no encouragement. By the advice, however, of Sir William Hamilton, whom he met at Palermo, he resolved to prosecute the undertaking on his own account; and accordingly he engaged a number of Italian artists, both draughtsmen and modellers, to proceed at once to Athens. Here they spent several months during the years 1800 and 1801 in making drawings, &c. at his expense. Subsequently Lord Elgin was able to obtain from the Turkish government permission not only to make casts of whatever objects he thought proper, but also to remove as many of the objects themselves as he chose. He himself left Turkey in 1803;

but, till the year 1816, he continued to employ agents at Athens in the work of selecting ancient marbles, and shipping them, or casts from them, for this country. The result was the formation of the splendid collection since known as the Elgin Marbles. The total expense incurred by his lordship in the undertaking, from its commencement in 1799 to its conclusion in 1816, was said to be £74,000. To reimburse himself, he was willing to sell the collection to Parliament. In the year 1811, while the collection was still incomplete, Mr Percival proposed to give him £30,000 for it; but this offer was rejected. In 1815, however, Lord Elgin renewed the negotiation, and offered to accept such terms as Parliament, after due inquiry, might think reasonable. A parliamentary debate on the subject ensued, in which Lord Elgin was blamed by some parties for what they considered the barbarism of removing the marbles from their original site, and by others assailed for misdemeanour, in having had pecuniary transactions with a foreign government while he performed ambassadorial functions at its court. The final result was, that, after two valuations of the marbles had been received, the one by Mr Payne Knight, estimating them at £25,000, the other by Mr William R. Hamilton, estimating them at £60,800, an act was passed on the 1st of July 1816, purchasing them for £35,000. The king of Bavaria, it is said, was on the watch to purchase them, should the British parliament have neglected the opportunity.

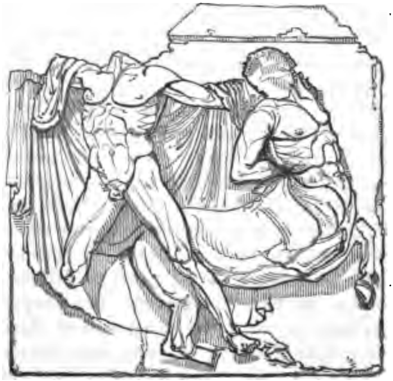
The buildings in Athens from which the marbles and casts forming the Elgin collection were taken were chiefly these—the Parthenon, the Erectheum, the Propylæa, the temple of Theseus, the theatre of Bacchus; and three other monuments, which we have not yet mentioned—namely, a small temple of the goddess Victory, and the Choragic monuments of Lysicrates and Thrasyllus. The collection contains, however, many miscellaneous objects not referable to any of those buildings.

SCULPTURES FROM THE PARTHENON.—These constitute by far the most interesting and valuable portion of the collection, and deserve special attention.

The Parthenon was the most striking object in ancient Athens, standing as it did on the highest part of the Acropolis, and overtopping every other building; and even yet its ruins are the first thing that attract the eye of the tourist as he approaches the celebrated site. The appearance and construction of the edifice are thus described by Colonel Leake in his 'Topography of Athens:'—'The Parthenon was constructed entirely of white marble from Mount Pentelicum. It consisted of a cell, surrounded by a peristyle, which had eight Doric columns in the fronts, and seventeen in the sides. These forty-six columns were 6 feet 2 inches in diameter at the base, and 34 feet in height standing upon a pavement, to which there was an ascent of three steps. The total height of the temple above its platform was about 65 feet. Within the peristyle, at either end, there was an interior range of six columns, of 5½ feet in diameter, standing before the end of the cell, and forming a vestibule to its door; there was an ascent of two steps into these vestibules from the peristyle. The cell, which was 62½ feet broad within, was divided into two unequal chambers, of which the western was 43 feet 10 inches long, and the eastern 98 feet 7 inches. The ceiling of the former was supported by four columns of about 4 feet in diameter, and that of the latter by sixteen columns of about 3 feet. It is not known of what order were the interior columns of either chamber. In the eastern chamber of the Parthenon the smallness of the diameter of the columns leaves little doubt that there was an upper range, as in the temples of Pæstum and Ægina. Such was the simple construction of this magnificent building, which, by its united excellencies of materials, design, and decorations, was the most perfect ever executed. Its dimensions of 228 feet by 102, with a height of 66 feet to the top of the pediment, were sufficiently great to give an impression of grandeur and sublimity, which was not disturbed by any obtrusive subdivision of parts. In the Parthenon, whether viewed at a small or at a great distance, there was nothing to divert the spectator's contemplation from the simplicity and majesty of mass and outline, which forms the first and most remarkable object of admiration in a Greek temple; and it was not until the eye was satiated with the contemplation of the entire edifice, that the spectator was tempted to examine the decorations with which the building was so profusely adorned.' Fully to realise this description of Colonel Leake, the visitor to the museum ought, before examining the detached sculptures in the Elgin Saloon, to familiarise himself with a fine model of the Parthenon in its original state, which is placed in the adjoining Phigalian Room, together with another model exhibiting the same building in its modern and ruined condition. An attentive study of the former of these models will enable him afterwards to refer the separate marbles to their proper places. It may be well also, in order to form some idea of the real dimensions of the edifice of which this model exhibits the proportion, to bestow a glance at the same time on an actual specimen of a capital with a portion of the shaft of one of the columns, to be seen in the Elgin Saloon (No 112). The building, it may be remarked, though of imposing dimensions, was not of the largest size. Various ancient temples, that could not compare with it in point of beauty, exceeded it in this respect; the famous temple of Diana at Ephesus, for example, being nearly twice as long.

While the design of the building is doubtless to be attributed to the architect Ictinus, the sculptures that decorated and formed so important a feature in its general appearance are as certainly to be regarded as the product of the invention of Phidias. Under his superintendence we are to suppose it was, and according to designs furnished by him, that the ablest chisels of Athens worked for years on those wonderful blocks and slabs of marble that now attract visitors to the Elgin Saloon. These sculptures of the Parthenon are of three distinct kinds: 1. Metopes from the frieze of the peristyle—that is, sculptured partitions or compartments of that frieze separated from each other by intervening grooved spaces called Triglyphs; 2. Portions of the frieze that ran round the top of the cella within the peristyle; 3. Statues or parts of statues from the tympana or pediments—that is, from the triangular spaces above the columns at the two fronts or narrow ends. For a correct conception of these three kinds of sculptures, their position, and their decorative effect, the visitor ought to consult the model, where they are all very neatly represented.

Metopes.—It must have been a matter of serious deliberation with Phidias what subject or subjects he should select for so important a part of the decorative sculptures of the Parthenon as the frieze of the peristyle. But he did not require to deliberate long. What subjects, in such a case, could be preferred to 'The Battle of the Centaurs and the Lapithæ,' 'The Battles of the Greeks and the Amazons?' &c.—subjects already consecrated to art by the efforts of innumerable poets, painters, and sculptors; familiar to the imagination of all Greeks; and specially dear to the Athenians, on account of their connection with their own legendary history. Who even now does not know the fable of the Centaurs and the Lapithæ—how there was a great feast to celebrate the marriage of Pirithous, king of the Lapithæ, a Thessalian nation, with the beautiful Hippodamia; how there came to this feast, among other guests, the terrible Centaurs, half-man, half-horse in form, the monstrous progeny of Ixion and the Cloud; how, mad with wine, the brutal Centaur, Eurytus, offered violence to the bride; how then Theseus, the Athenian hero, the friend of Pirithous, rose and hurled a wine-pitcher at the Centaur's head, striking him lifeless with the blow; how, to avenge their brother, the Centaurs sprang up, trying equally to kill the men and to carry off the women; how the Lapithæ—or rather the Athenians, the companions of Theseus—grappled with them, and, after a furious battle, defeated them; and how, after that, the Centaurs were driven out of Thessaly, and took refuge in Arcadia, where Hercules destroyed them all? Such was the story selected by Phidias for a portion at least of the sculptures of the peristyle. In twenty-three out of the thirty-two metopes or compartments of the southern side, this story was represented. In one metope there was the beginning of the fray—Theseus hurling the wine-pitcher; in another, a Centaur and an Athenian were in close grapple, the Athenian conquering; in a third, the Centaur was about to be victorious; in a fourth, an Athenian had slain his enemy; in a fifth, a Centaur was bounding off in triumph from a dead Athenian; in a sixth, a Centaur was carrying off a female; and so on, each metope containing a separate fragment of the great action. In this manner twenty-three metopes were filled up. But the frieze of the peristyle contained in all ninety-two metopes—thirty-two on each side, and fourteen on each front; there still remained, therefore, sixty-nine metopes still to be provided for. For these other subjects were selected. The metopes of the north side, it would appear, were occupied chiefly with the Battle of the Amazons; those of the eastern front with legendary exploits of Minerva and Athenian heroes, treated as in the ancient vases; those of the western front with groups of two pedestrians, or of one horseman and one pedestrian fighting, the subject being, as is supposed, the war of the Greeks with the Persians. The various metopes, which were all in very high relief, were of various execution — some being masterpieces, and others by no means remarkable for their excellence. To account for this, it has been supposed that Phidias, while he employed in the work as many of his own disciples as possible, was obliged at the same time to intrust a portion of it to artists of inferior merit, and less practised in his style.

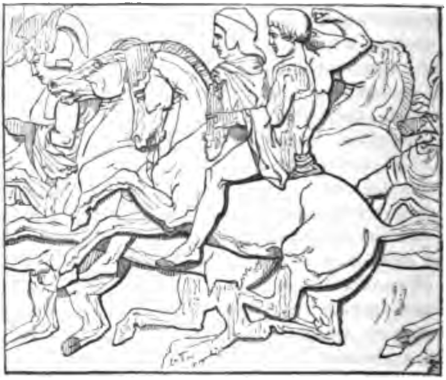


Metopé, No. 11.

The metopes in the museum are sixteen in number, all from that part of the frieze devoted to the Battle of the Centaurs and the Lapithæ; fifteen are original; but one (No. 9) is a plaster-cast, taken from the original metope in the museum of Paris, for which, by itself, the French government paid 25,000 francs (£1000). All are more or less broken. Perhaps the finest of the whole are the two marked No. 11 and No. 12. In metope No. 11 (see previous fig.) an Athenian is represented holding a Centaur by the face, and about to strike the fatal blow. A mantle suspended from the shoulders of the Athenian hangs nearly to the ground at the back of both figures. The body of the Athenian, which fronts the spectator, is almost completely detached from the tablet, and is finished as carefully at the back, where it is not seen, as in front. In metope No. 12 the Centaur is victorious. Holding in his left hand a lion's skin, he is trampling exultingly upon the dead body of an Athenian stretched on the ground. The whole expression of this metope is much admired.

Portions of the frieze of the cella.—In his selection of a subject for the frieze of the cella, Phidias was as happy as in his selection of subjects for the frieze of the peristyle. As the Battle of the Centaurs, the Battle of the Amazons, &c. formed appropriate subjects for the one, so the great procession of the Panathenaic Festival could not but form an appropriate subject for the other. This festival, as has already been mentioned, was the national fête of the Athenians, founded by Theseus, or, as the others said, by Erectheus. The Less Panathenæa, as they were called, were held every year; but the great feast, to which alone the name was properly given, occurred but once in five years, on the 28th day of the month Hecatombæon—the first month of the Athenian year. The festival was strictly Athenian, but spectators flocked to it from all parts of Greece; and during the supremacy of Athens, every subject state was obliged to contribute an ox on the occasion. Games of all kinds, horse and foot races, &c. formed part of the entertainment; but the grand attraction was a procession to the temple of Minerva (the Parthenon itself, after it had been built), there to deliver to the goddess a sacred peplus or robe, worked for the purpose by selected Athenian maidens of the most distinguished families. On the robe were embroidered sacred subjects, and the names of citizens who had earned the public gratitude by great actions since the last Panathenæa. Brought early in the morning from the Acropolis, where it had been worked, the peplus was hung as a sail on a small model of a ship; this ship was carried through certain streets and suburbs of the lower city, all who chose—whether men or women, Athenians or strangers—joining in the procession, in such guise as they preferred; then ascending the Acropolis, the procession divided on the west front of the Parthenon into two columns, which moving round the temple, one on each side, met at the door in the eastern front; when, the bearer of the peplus entering the temple with the two arrephoræ, or superintendents of the sempstresses, delivered his sacred burthen to the archon and the priestess of the goddess; by whom, in conclusion, it was offered and dedicated in the interior shrine. To represent in sculpture so extensive a subject was certainly a bold undertaking; but Phidias accomplished it to admiration. On a series of slabs, each 3 feet 4 inches high, surrounding the whole interior cella, and forming a continuous length of no less than 524 feet, was sculptured in the most vivid manner a perfect epitome of the procession—men, women, and children, in all costumes, and in all attitudes; horsemen, charioteers; oxen, and other victims for sacrifice; images of the gods; sacred flagons, baskets, &c. &c.; and, prominent amid all, the peplus itself. The Panathenaic frieze, as it is called, was therefore probably the largest piece of connected sculpture ever attempted in Greece. Considering the lowness of the relief, which was rendered necessary by the position of the frieze (seen only in a secondary light, and obliquely, and not in the direct blaze of the sun, like the metopes of the exterior), the animation and air of reality thrown into the sculptures are astonishing. Artists speak in raptures of the Panathenaic frieze. The horses especially, of which there were in all 110, no two in the same attitude, are the theme of admiration. 'They appear,' says the sculptor Flaxman, 'to live and move; to roll their eyes, to gallop, prance, and curvet; the veins of their faces and legs seem distended with circulation; in them are distinguished the hardness and decision of bony forms, from the elasticity of tendon and the softness of flesh. The beholder is charmed with the deer-like lightness and elegance of their make; and though the relief is not above an inch from the background, and they are so much smaller than nature, we can scarcely suffer reason to persuade us that they are not alive.' On the Panathenaic frieze a multitude of artists must have been employed; and here, as in the metopes, may be discovered differences of style and skill.

The slabs in the museum amount in all to about 326 feet of the Panathenaic frieze, or considerably more than half of the whole; of these, however, about 76 feet consist of casts, leaving about 250 feet of the genuine marble that Phidias put up. 'The slabs are arranged,' says the catalogue, 'as nearly as can be ascertained, in the order in which they were originally placed in the Parthenon. Those on the principal front of the temple—namely, the east—commence on the left hand of the visitor as he enters the room, then follow those on the north, and lastly, those of the west and south.' The sculptures on many are much defaced, but on some they are nearly perfect. Leaving the visitor to examine and admire the various portions of the frieze in detail, let us point out particularly for his notice the series of slabs from No. 37 to No. 43 inclusive. These seven slabs, which are from the frieze of the north side, and form part of a train of citizens on horseback, are considered as being, in point both of composition and execution, perhaps the finest known specimen of ancient low-relief sculpture. The slab No. 47, representing two horsemen—one riding before the other, and beckoning him on—is also much admired. This slab is the only original from the frieze of the western front, the other slabs representing the sculptures of that frieze (Nos. 48—61) being casts. 'There is a peculiarity,' says the catalogue, 'in the frieze of this west end which distinguishes it from that on the north and south sides of the temple. The subjects represented on the slabs of these two sides run into one another—that is, what was left imperfect on one slab is completed in the next; whereas in the west end, the subjects are nearly complete on each piece of marble. The western frieze is likewise distinguished from those of the two sides of the temple by the comparatively few figures introduced into it.' The intention apparently was to represent the figures on this frieze as stragglers closing the procession.



Panathenaic Frieze, No. 42.

Statues or parts of statues from the pediments.—If it was not without deliberation that Phidias decided on the subjects for the metopes of the peristyle and the frieze of the cella, we may be sure that his choice of subjects for the sculptures of the two pediments was a matter of even greater anxiety with him, for of all parts of a Greek temple the pediments were perhaps the most important. 'The sculptors of the pediments,' says Mr Cockerell in his description of the museum marbles, 'bore at least an equal degree of importance with the architecture, which was indeed the frame and vehicle of these works, and in some degree subservient to them. The number of figures introduced into the pediment depended on the style or number of columns of which the front was composed, and was proportioned to the size of the order; thus, in a temple that was octastyle (had eight columns in front), from twenty to twenty-five figures appear to have been employed; in the temple of Jupiter at Olympia, which was hexastyle (had six columns in front), from eleven to fifteen; in the hexastyle temple of Jupiter Panhellenius at Ægina, the same number.' By an architectural necessity, therefore, the subjects for the two pediments of the Parthenon required to be such as would admit of from twenty to twenty-five figures. Farther, the triangular form of the pediments imposed this additional limitation—that the figures should be more colossal or elevated in the middle, and smaller, or less erect, towards the sides; and this, too, without detriment to the harmony of the composition. Lastly, it was absolutely necessary that the subjects, like those of the metopes and the frieze of the cella, should relate to the mythological history of the goddess to whom the temple was dedicated.

All these conditions appear to have been admirably fulfilled by the choice of subjects actually made by Phidias:—'The birth of Athene (Minerva)' for the eastern and principal pediment; and for the other 'The Contest between Athene and Poseidon (Neptune) for the guardianship of Attica.' Such at least, as far as can be inferred from the remaining fragments, and from the drawings we possess of the Parthenon while it was more complete than it now is, seem to have been selected by the sculptor. Nor could any others have been so appropriate. How, amid the astonished inhabitants of heaven, the virgin goddess sprang mature and ready-armed from the head of her father Jupiter, when it was severed by the axe of Vulcan; and how long afterwards she and the god Neptune contended on the Acropolis amid the local deities and the primeval heroes of Attica for the guardianship of so good a land—she causing the olive-tree to spring up where she stood, and he making water gush out from the ground by a stroke of his trident: what legends could be dearer than those to the heart of an Athenian? Treated as they had been by many artists before, Phidias resolved to treat them again in his own manner. What precise arrangement of the figures he adopted in each case, or even what the figures were that he actually introduced, has been a matter of dispute among artists and archæologists. Regarding the western pediment, indeed, in which most of the figures were left standing, there could be no great controversy; but as in the eastern pediment only a few of the figures remained, it is only by conjecture and inference that it can be figured in its original and complete state. The restoration of the sculptures of both pediments as proposed by Mr Westmacott, after the suggestion of the Chevalier Brondsted, is probably the most accurate, as it is certainly the most poetical of any yet attempted.

In the eastern pediment, Mr Westmacott supposes the centre figure to have been Zeus, or Jupiter, the father of gods and men, represented as seated on his throne in the middle of the whole universe, between Day, or the Beginning of Things, on his left, and Night, or the End of Things, on his right hand. The great deity was in the act of giving birth to the divine Athene, 'who was represented as the supreme miracle of creation rising from behind the god in all the splendour and effulgence of the most brilliant armour, her golden crest filling the apex of the pediment.' On either side of this centre-piece were the primeval gods and goddesses of Olympus, the statues to the right of Jupiter (to the left of the spectator) representing 'those deities that are connected with the progress of facts and rising life, while those to the left (to the right of the spectator) relate to the decline or consummation of things.' Immediately to the right and left of Jupiter are 'the genethlic divinities, or those which preside over birth;' to his right Venus Urania, or Celestial Venus, and beside her Hephæstus, or Vulcan, whose important part in the action was supposed to be over; to his left Eileithyia (the goddess of childbirth), balanced against Venus Urania, and, by her, Prometheus, balanced against Vulcan. 'The next in this classification was Mars, an appropriate attendant at the birth of a goddess essentially warlike; whilst Mercury balanced the space near Prometheus. Themis, the first wife of Jupiter, the mother of the Horæ, or Seasons, and also of the Fates, occupied the place near Mars; whilst the next in succession, and corresponding with Themis, to the left of Mercury, was most probably Vesta.' After these ten central statues—namely, Jupiter, Minerva, and the four attending divinities on each side—followed on the right (that is, after Themis), a group of three figures — two seated, and one advancing or flying — usually supposed to be Ceres and her daughter Proserpine with Iris the messenger of the gods, but interpreted by Mr Westmacott to represent the three Horæ, or Seasons, the beneficent daughters of Themis, and the openers of the gates of heaven, two of them—Dice and Eunomia—being seated, while the third—Irene—has begun her course, but still holds one of her sisters by the hand. Balancing these on the left side (that is, after Vesta) was another group of three figures representing the Fates, two of whom—Clotho and Lachesis—were seated, while the third—Atropos—reclined in the lap of one of her sisters. Lastly, on the extreme right filling the angle was a recumbent statue, usually called Theseus, but more properly supposed to be the god Cephalus, gazing at the car of the sun, which was seen, together with the horses' heads, and the upper part of the figure of the sun-god, Helios himself, just emerging from the sea; and, similarly placed in the angle on the extreme left was the winged-goddess Selene, or Night, descending with her chariot into the ocean, her horses just sinking beneath the waves. According to this restoration, the entire number of figures in the pediment (counting each of the two chariots with its horses and drivers but as one) would be sixteen; the probability is, however, that there were one or two more, which we cannot now supply, placed near the Seasons, on the one side, or the Fates on the other.[*]

Of the western pediment, Mr Westmacott's restoration is as follows:—'Minerva and Neptune are placed near each other in the centre, Minerva on the left, Neptune on the right of the spectator: the latter is represented as having struck the earth with his trident, from which a stream of water is issuing, whilst the olive-tree of Minerva occupied the space between the deities, and rose to the apex of the pediment. The chariot of Minerva followed the goddess, accompanied by Victory without wings, who always conducted the car of Minerva, attended by Erichthonius, who performed the part of groom. This group was evidently balanced by the chariot of Neptune on the other side, supported by two figures—namely, Amphitrite, the wife of Neptune, and Leucothea or Halia (a mythical personage who threw herself into the sea). They were followed by a female figure with two children in her arms, representing *Gè Kourotrophos*, or Earth the Nourisher.' After her on the same side came Thalassè, or the sea, with young Venus in her lap, attended by Galena, or Calm; while following these were Cephisus, the god of the Attic river of that name, with his daughter Praxithea. Balancing all these on the Minerva side, and following the chariot of the goddess, with its attendants Victory and Erichthonius, were Cecrops, the Attic demigod and his family, Herse, Aglauros, Pandrosos, &c. Lastly, the two angles were occupied, that on the Minerva side by a recumbent statue of Ilissus, the Attic river-god, and that on the Neptune side by a recumbent statue of the nymph Callirrhöe, the divinity of the only well of spring water which was known at Athens.

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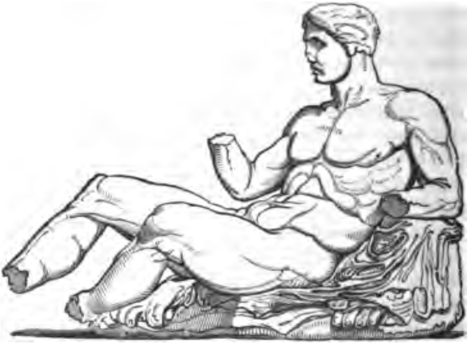
[*] The proposed restoration of Mr Westmacott, it is right here to remark, differs considerably from that adopted in the restored model of the Parthenon placed in the Phigalian Room. There, too, the central figure is Jupiter; but Minerva, instead of rising from behind him, as in Mr Westmacott's restoration, is on his right hand, already born, and receiving, as it were, his congratulations. On her left is Vulcan, leaning on the hatchet with which the work has been done. The other figures are also different. Besides these two restorations, others still different have been proposed by M. Quatremère de Quincy, and by Mr Cockerell.

Of the two grand compositions thus described—compositions upon which, if upon any portion at all of the exterior sculptures of the temple, we may imagine Phidias himself to have occasionally employed his chisel—only a few fragments remain. These, however, are sufficient to show what a grand art ancient statuary must have been.

To the eastern pediment belonged Nos. 91—98; they are fragments, therefore, of the great composition of the Birth of Athene. Nos. 91 and 92 are fragments of the group that occupied the left angle of the pediment—Helios, the sun-god emerging in his chariot from the sea. No. 91 is the upper part of the god himself, the arms stretched forward, holding with god-like art the reins of his coursers atop the waves; in No. 92 we see the heads of the horses, just raised above the water, and snorting to begin the race. No. 93, which is the best preserved statue in the collection, is the recumbent statue of the so-called Theseus, supposed (see above) by Mr Westmacott rather to represent Cephalus, and by some again taken for Hercules. The reason why Mr Westmacott and others refuse to believe that the statue was meant for Theseus is, that this hero, not being one of the primeval divinities, but only a later accession to the Pantheon, could have



Theseus, No. 93.

been made present at the birth of Minerva only by the courtesy of the sculptor, in disregard both of chronology and popular legend. But for whatever divinity or hero the statue was intended, whether for Theseus, for Cephalus, or for Hercules, it is certainly a masterpiece. Naked, and reclining with his left elbow upon a rock covered with a lion's skin, the hero watches the horses of Helios as they rise. 'The whole effect of the figure,' says Sir Henry Ellis, 'is admirable; and so universally have artists been attracted by its excellence, that more drawings have been made from it than from all the other Athenian marbles put together. It combines ideal beauty with the truth of nature; and, even anatomically speaking, the muscles are allowed to be invariably true to the attitude. "I should say that the back of the Theseus was the finest thing in the world," were the words of one of our most eminent sculptors, when giving evidence before a committee of the House of Commons. It is unquestionably finished in the very perfection of art.'* Nos. 94 and 95 are the three goddesses supposed by Mr Westmacott to be the three Horæ, or Seasons, two of whom are seated, while the third has risen, and is flying, or about to fly; but usually pronounced to be Ceres and Proserpine (the seated figures), and Iris, the messenger of the gods (the standing figure), hastening to proclaim to distant regions the birth of Athene. No. 96 is a torso of a figure supposed to be Victory, whose place in the original pediment is not very well ascertained. The figure had originally bronze wings, gilt; and the holes in which these wings were inserted may still be seen in the marble. No. 97 is the group of the three Fates, that stood on the right side of the pediment, balancing Nos. 94 and 95 on the left side. 'Mr West,' says Sir Henry Ellis, 'spoke of these figures in terms of high eulogium. The grace of the attitudes, and the disposition of the draperies, are equally deserving of admiration.' So evident are these merits, that even the uninstructed visitor, passing along the Elgin Saloon, is sure to be arrested by these figures, and to linger a little while near them. The breadth of the two recumbent figures alone is 8 feet 9 inches. No. 98 is the head of one of the horses of Night, whose descending car, as was stated above, occupied the angle on the right side of the pediment. This head is of the finest possible workmanship; its dimensions are 2 feet 6 inches in length, by 1 foot 7½ inches in height. 'Mr R. P. Knight,' says Sir Henry Ellis, 'valued the granite scarabæus which Lord Elgin brought from Constantinople (see Egyptian Room) at £300; and this horse's head at £250. We think few people will be inclined to agree with him.'

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* The Elgin Marbles. By Sir Henry Ellis. 2 vols. London.

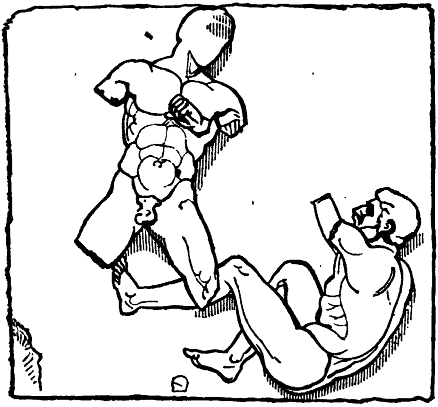
The fragments from the western pediment (Nos. 99—106) are placed apart. No. 99 is a fragment of the recumbent statue of the river-god Ilissus, that occupied the angle of the left or Minerva side. This figure is particularly admired; Canova, Visconti, and other eminent artists, pronounced it equal to the Theseus (Cephalus) of the other pediment. The attitude is one of the boldest that could be attempted. The river-god, hearing with joy the news of the victory of Minerva, seems to raise himself suddenly from the bed of the stream, resting the whole weight of his body on his left hand and arm. 'This motion,' says Sir Henry Ellis, 'causes the whole figure to appear animated; it seems to have a life which is found in very few works of art. The illusion is still more strengthened by the perfect expression of the skin, which in several parts of the statue, owing to its situation and position, have been better preserved than in any of the others: one is almost tempted to call it perfectly flexible and elastic.' No. 100 is a torso, supposed to be a fragment of the statue of Cecrops. Nos. 101, 102, and 103, are small fragments of the two principal figures of the pediment—the Minerva and the Neptune. No. 101 is the upper part of the face of the goddess; it is 14 inches broad; the eye-sockets are hollow, having been originally filled, doubtless, with coloured stones to represent the eyes; there are also marks indicating where the bronze helmet was fitted to the head. No. 102 is a part of the chest of the goddess, armed, as usual, with the ægis, and having marks showing where certain bronze ornaments were fastened. No. 103 is the upper part of the torso of Neptune, the back of which is better preserved than the front. The god was represented, it would seem, in the act of retiring or starting back, astonished at the appearance of the olive-tree which had risen at the stroke of Minerva's spear. From the proportions of these remaining fragments of the god and goddess, it is ascertained that the height of the figures, when complete, must have been about 12 feet. No. 105 is the torso of the wingless Victory, the conductress of Minerva's car. No. 106 is a fragment of the group, according to Mr Westmacott, of Gè Kourotrophos with the two children in her arms; or, according to another account, of Latona with her two children, Apollo and Diana.

SCULPTURES FROM THE ERECTHEUM.—The principal fragments from this celebrated edifice—the companion on the Acropolis of the more splendid Parthenon—are those marked 108, 110, 114, 118, 125, 126, 127, 128, 219, 220, 252, 253, 254, and 255. These fragments are chiefly architectural—that is, portions of the ceiling, portions of the architrave, fragments of columns, &c. The most worthy of attention are Nos. 125, 126, and 127, which are respectively the capital, part of the shaft, and the base of one of the Ionic columns of the portico; No. 128, which is a beautiful caryatid statue 7 feet 9 inches high, one of six that supported the roof of that division of the Erectheum called the Pandrosion, or Temple of Pandrosos, in which was kept the original olive-tree that Minerva had caused to spring up; and Nos. 252–255, which are four pieces of the frieze, enriched with flowers and other ornaments, 'designed,' says the catalogue, 'with perfect taste, and chiselled with a degree of sharpness and precision truly admirable.'

SCULPTURES FROM THE PROPYLÆA.—This monument, the position and purpose of which have already been mentioned, is said to have been 'a hexastyle colonnade, with two wings, and surmounted by a pediment.' Whether the metopes and pediment were decorated with sculpture, is not known. The fragments of the edifice in the Elgin collection are those marked No. 130 and 131; the one being the capital of a Doric column, the other part of a Doric entablature.

SCULPTURES FROM THE TEMPLE OF THESEUS.—It was not till the year B.C. 465, or about thirty years before the building of the Parthenon, that the Athenians erected a temple to their national hero Theseus. The reason for their doing so after so long a delay was, that the spectre of the hero had been seen fighting, as the soldiers said, at the battle of Marathon. When, in consequence of this prodigy, the Athenians consulted the Delphic oracle, they were commanded to atone for their long ingratitude by bringing the bones of Theseus from the island of Scyros, where they had been buried, and keeping them sacred at Athens. As the Athenians did not know in what precise spot of the island Theseus had been buried, they could not at first fulfil the command; but Cimon, the son of Miltiades, having conquered the island B.C. 476, a spot was miraculously revealed to him where, upon digging, was found the skeleton of a warrior, concluded to be that of Theseus. The bones were brought to Athens, where they were received with divine honours; a festival was instituted to commemorate the event, and it was resolved to build a temple to the demigod. Such was the origin of the Theseion, or Temple of Theseus, the most important building in Athens till the Parthenon rose to eclipse it. Situated in the lower city, in the quarter called the inner Ceramicus, it was less exposed to injury than buildings on more elevated sites; and of all the ancient Athenian monuments that have survived to our day, it is the best preserved. 'It is a peripteral hexastyle temple, with thirteen columns on each side, which are not quite 19 feet high, and only 3 feet 4 inches in diameter at the base. The whole is constructed of Pentelic marble. The pediment of the chief or eastern front was adorned with statues, but the western front had none. The ten metopes of the eastern front, and the four adjoining ones on each flank, are the only metopes adorned with sculptures; but there are sculptures on the frieze over the entrance both of the posticum and pronaos. Unfortunately the Turks have disfigured all of them, though enough remains to show that the labours of Hercules and Theseus were the subjects. The roof of the cella (which is 40 feet long within the walls, and 20 feet wide) is modern; but with this exception, and that of the two pillars of the pronaos, which have been removed to make way for a Christian altar, the temple is in perfect preservation. The traces of paint of various colours on the figures of the metopes and the frieze are said to be still clearly discernible.'*

Of the more important sculptures of this beautiful little temple, the museum possesses a set of casts—namely, Nos. 136–157 of the Elgin collection. Nos. 136-149 are casts from the frieze of the pronaos (front), 2 feet 9 inches high; the subject is a battle fought by numerous warriors in the presence of six seated divinities. Stuart, in his work on Athens, offers the supposition that the frieze was intended to represent the battle of Marathon, with Theseus among the combatants, and six deities looking on; but the more likely explanation is, that it represented the battle of gods and giants—the six principal deities taking no part in the action, but the younger ones, such as Mars, Apollo, Mercury, and Bacchus, fighting by the side of the great combatant Hercules. Nos. 150-154 are casts from the frieze of the posticus (back), representing the battle of the Centaurs and the Lapithæ: No. 150, a Centaur about to dash a huge stone upon a prostrate Lapitha; No. 151, a Centaur with a trunk of a tree on his shoulders, a Lapitha close behind him;



Metopé, No. 155, from the Theseion.

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* 'The Elgin and Phigalian Marbles.' By Sir Henry Ellis. Vol. i. pp. 32, 33.

No. 152, two Centaurs crushing a Lapitha under a great mass of rock; and so on. Nos. 155–157 are casts of three of the metopes of the north side of the temple—the first representing Theseus killing Creon, king of Thebes (see previous fig.); the second Theseus throwing Cercyon, king of Eleusis, in a wrestling match; and the third Theseus fighting with the Cremmian sow.

SCULPTURES FROM THE TEMPLE OF APTERAL VICTORY.—On the Acropolis, not far from the Propylæa, there originally stood a small Ionic temple dedicated to the goddess Apteral Victory—that is, Wingless Victory—the charioteer of Minerva. This temple had disappeared before the time of Lord Elgin's visit to Greece; but there remained scattered about various bas-reliefs that had belonged to it, and these Lord Elgin secured. They are those marked 158, 158*, 159, 159*, 160, 160*, 161, 161*, in the Elgin collection. These bas-reliefs, which are of very fine execution, though much damaged, are from the friezes of the temple. Nos. 158, 158*, and 159, represent a combat between Greeks and Persians; Nos. 159*, 160*, and 161*, represent a group of two females leading a bull, a third standing, and a fourth adjusting her sandal; Nos. 160 and 161 represent a combat in which all the figures seem to be Greeks. The bas-reliefs are about 17 inches high.

SCULPTURES FROM THE THEATRE OF BACCHUS.—From this celebrated theatre, in which, in its palmy days, were performed the tragedies of Aeschylus, Sophocles, and Euripides, there is but one relic in the museum—the bas-relief marked No. 193. It was found among the ruins on the site of the temple, and represents a Bacchanalian group, 'consisting of four figures, each carrying a thyrsus; one of these is Bacchus dressed in the Indian costume, who with his right hand is holding a double-handled vase, into which a female Bacchante is pouring wine from a one-handled vase. On each side of these figures is an elderly Faun in a dancing attitude; and one of them is glancing his eye at the contents of a large vessel of wine placed on the ground.' The length of the bas-relief is 5 feet 7 inches; its height 2 feet 6 inches.

SCULPTURES FROM THE CHORAGIC MONUMENTS OF LYSICRATES AND THRASYLLUS.—It is well known that the first theatrical performances among the Greeks consisted merely of *choruses*—that is, of songs or hymns sung by a large number of men and boys, all of whom gesticulated or danced while they were singing. It was not till a comparatively late period that these choruses were intermingled with dialogue; and even after this change had been made, the chorus continued to be regarded as an essential and important part of the dramatic performance. On other occasions, too, it was common to employ a chorus of singers for the entertainment of the company that chanced to be assembled. So necessary was this kind of excitement with the Athenians, and such was the importance attached to it, that the duty of providing it was devolved on special civic functionaries. 'Each phyle, or tribe, had a choragus (that is, leader of the chorus), who was obliged to provide a chorus to perform at the representations in the theatre, and at many religious solemnities. The office was probably rotatory, though none but rich persons, able to bear the expenditure without inconvenience, could be forced to take it. The choragus had entire charge of the whole choral apparatus; he paid for the dresses and all the decorations. He also provided and paid a teacher, who instructed and trained the choristers.' In each tribe the choragus appears to have provided a chorus of boys, and one of men; and the choragi of the various tribes vied with each other in the splendour with which they brought out their entertainments on the proper occasions. The most successful choragus of the year (that is, the choragus who pleased most at the Dionysiaca, or annual feast of Bacchus) was rewarded with a prize—usually a bronze tripod; and it was customary for the winner to dedicate this prize to Bacchus, sometimes even erecting a monument on which to place it. Such monuments were called choragic monuments. Among the remains of ancient Athens are two beautiful little monuments of this class—the one called the choragic monument of Lysicrates, and sometimes also the Lantern of Demosthenes, from a popular notion, still current at Athens, that the great orator used it as a place of study; and the other the choragic monument of Thrasyllus.

The monument of Lysicrates, which is situated to the south-east of the Acropolis, consists of a small circular colonnade of Corinthian columns resting on a high quadrangular pavement, and surmounted by a low cupola of a single mass not more than six feet in diameter. On this cupola originally stood the prize tripod, to commemorate the winning of which the monument was erected. The choragus who erected it was Lysicrates, the son of Lysetheides, a person of whom nothing else is known: the date of its erection was B.C. 325, in which year, it appears from an inscription on the monument itself, the tribe of Acamas, of which Lysicrates was choragus, 'obtained the victory in the chorus of youths.' The frieze of the edifice is decorated with sculptures in half-relief 9½ inches in height. The subject is the story of Bacchus and the Tyrrhenian pirates—how the god hired the ship of the pirates to convey him from Icaria to Naxos; how the treacherous sailors diverted their course to Asia, meaning to sell him for a slave; and how the god discovered their treachery, and punished them by turning them into dolphins, and otherwise tormenting them.

In the museum (Nos. 352–360) is a series of casts from the sculptures well worth notice. They are thus described by Sir Henry Ellis:—'Bacchus occupies the centre of the composition (No. 356), seated upon a rock with his panther before him; he is represented larger in size than any of the other figures. On either side of him sits a Faun, as in attendance; and beyond them stand two Fauns (Nos. 355, 357), each with a cup in one hand, and a pitcher in the other approaching two large vases. They seem to be diligent in the office of administering wine to Bacchus and his train, the whole of which is composed of the same imaginary species of beings. These are of different ages, and are almost all engaged in chastising the pirates, three of whom (Nos. 352, 353, and 359) are represented at the instant of their transformation into dolphins.'

The choragic monument of Thrasyllus was erected B.C. 320 by a person named Thrasyllus, to commemorate the victory of the Hippothoontic tribe in the choruses of men while he was choragus. It stands on the south side of the Acropolis, near the site of the theatre of Bacchus. The principal ornament of this monument was a colossal statue of Bacchus placed on its summit twenty-seven feet from the ground, supporting in its lap the prize tripod that had been won by the happy choragus. This statue, or a fragment of it, remained in its original position till it was removed by Lord Elgin. It is now in the Elgin Saloon—No. 111; and after the Phidian sculptures, is one of the most attractive objects the saloon contains. It represents the god seated, covered with a lion's skin, and with a broad belt round the waist; the style is magnificent.

MISCELLANEOUS SCULPTURES, &c.—Among the numerous objects in the Elgin Saloon besides those already noticed, we have space to point out but a few; although there is hardly one in the whole collection that, if all its associations were known, would not be viewed with interest. Conspicuous among all is a statue of a youth (No. 113) wanting the head, and portions of the arms and legs. The figure is that of Icarus; and the statue formed part, it is supposed, of a group of Dædalus and Icarus. The sculpture is so exquisite, that some have maintained that the statue must have belonged to one of the pediments of the Parthenon; all that is certainly known, however, is, that it was brought in fragments from the Acropolis, and put together in this country. A curious series of objects are those marked Nos. 209–218. They are votive sculptures brought from cavities or niches in the perpendicular face of the Pnyx at Athens—that is, of the huge artificial platform of rock (situated on a height near the Areopagus) where the Athenians held their public meetings. In these niches, as well as in the temples of certain gods, particularly Æsculapius, it was customary for persons that had been cured of any disease to deposit, in token of their gratitude, small sculptures, representing the part of the body that had been affected, and bearing some short pious inscription. Such are the objects above-mentioned. Nos. 209, 210, and 211, for example, are representations in bas-relief of the female breast—the offerings respectively of three Athenian ladies, Isias, Eutychés, and Onesime; No. 217 is a sculptured foot; and so on. A very beautiful relic is the bronze urn marked No. 199*, which, with its marble cover No. 199**, was found in a tumulus on the road that leads from Port Piræus to the Salaminian ferry and Eleusis. 'At the time of its discovery,' says the catalogue, 'this beautiful urn contained a quantity of burnt bones, a small vase of alabaster, and a wreath of myrtle in gold.' It has been surmised, without any good reason, that this urn contained the ashes of the celebrated Aspasia; the circumstance of the wreath of myrtle being found in it, however, renders it more probable that the deceased was some amatory poet. Omitting numberless other objects—such as busts, fragments of statues, sepulchral and other urns, sepulchral stelæ or columns, bassi-relievi, &c. &c. from various parts of Greece, but chiefly from the neighbourhood of Athens, let us notice, in conclusion, one or two of the many *inscribed monuments* that the Elgin collection contains. The first of these is the celebrated Sigæan marble (No. 107), so called because it originally stood on the promontory of Sigeum in the Troad. The inscription is in the oldest Greek character, and is written in what is called the *Boustrephedon* (literally ox-turning) manner—that is, the first line from left to right, the second from right to left, the third from left to right, the fourth from right to left again, and so on alternately, in the manner of an ox ploughing a field. The inscription consists of two parts. The first is to the following effect:—'I am the gift of Phanodicus, the son of Hermocrates of Proconnesus: he gave a vase, a stand for the same, and a strainer to the Sigeans for the Prytaneum (Town-Hall);' after which there follows the second part, which is but a repetition of the first, with this addition:—'If any mischance happens to me, the Sigeans are to mend me. Æsop and his brethren made me.' The stone, therefore, was set up by some 'Trojan Greek' named Phanodicus, to commemorate his own munificence in presenting the Sigeans with the vase, a stand for it, and a strainer. From the character of the writing, it is inferred that the monument must be very ancient. It was found in modern times forming a seat at the door of a Greek chapel, and resorted to by the people for many miles round, from a belief that it was charmed, and had the power of curing such as sat upon it of the ague. The inscription was consequently in great danger of being rubbed away; when the marble was fortunately procured by Lord Elgin, and brought to England. The whole locality, it is said, was thrown into mourning by the loss of so venerable a relic. More interesting from its historical associations than the Sigæan inscription, if not so valuable in a palæological point of view, is the inscription marked No. 348. This inscription, which was found in the Ceramicus of Athens, is nothing less than the epitaph upon the Athenian warriors that were killed at the celebrated battle of Potidæa (B. C. 432), at the commencement of the Peloponnesian war. It consisted of twelve elegiac lines, now much defaced, but the general meaning of which may still be made out. A sepulchral monument of a different character is that marked No. 366. It is to the memory of a young lady of extraordinary beauty named Tryphera, who died while only twenty-five years of age. The inscription, which consists of ten verses, has been thus translated:—

Adorned of late with flowing locks of gold;
A radiant eye that beamed with beauty's light,
Couched gracefully within the eyelid's fold;
A glowing cheek, a neck of snowy white;
A lovely mouth that poured a voice refined
Through vermeil lips, and teeth of ivory bright;
With each perfection in her form combined—
Lamented Tryphera in endless night
Here sleeps; Cilicia's daughter, once the pride
Of brave Eutychides her sire; her life
Five lustres only saw; the virtuous wife
Of Hermeros; he, of Erinne born
And Aristomachus, in grief forlorn
Has raised this marble to his virgin bride.

THE PHIGALIAN SALOON.

The contents of this room, omitting several statues which may be noticed more conveniently under the next head, are—1*st*, The Phigalian marbles—that is, marbles from the ruins of the temple of Apollo Epicourios (Apollo the Deliverer), near the site of the ancient city of Phigalia in Arcadia; 2*d*, Casts of the Æginetan marbles—that is, of certain sculptures found in the ruins of the ancient temple of Jupiter Panhellenius in the island of Ægina, and now in the collection of the king of Bavaria at Munich; 3*d*, Casts of the Selinuntine marbles—that is, of certain sculptures found at Selinunte, on the site of the ancient town of Selinus in Sicily: and 4*th*, Bas-reliefs from the celebrated mausoleum of Halicarnassus, one of the so-called seven wonders of the ancient world.

THE PHIGALIAN MARBLES.—It was about the year B.C. 450, or

B.C. 440 (for the date cannot be more exactly determined), that the people of the Arcadian town or state of Phigaleia resolved to build a temple to the god Apollo Epicourios, to whom, as they imagined, they owed some such special mark of gratitude for his care of them during a time of pestilence. Determined that the edifice should be one of the finest in the Peloponnesus, they employed upon it the celebrated architect Ictinus, the same who built the Parthenon. The site, too, on which they resolved it should be built was one of the best that could have been chosen—the lofty ridge of Bassæ between two summits of Mount Cotylium, from whose lovely oak-covered heights the eye could wander over nearly all Arcadia. The architect furnished a design corresponding with the site. Instead of facing east and west, like most Greek temples, that of Bassæ faced nearly north and south. Each front had six columns, and each side fifteen, and the cella alone had a roof, so that between the columns and the cella all round there was a rim of clear sky. The chief ornament of the temple, besides the bronze Apollo 12 feet high that stood in the middle of the cella, was a frieze about 2 feet 1¼ inches high, that ran round the interior at an elevation of about 21 feet from the ground. Such was the simple construction of a temple reputed to be the finest in the Peloponnesus, after that of Tegea.

More than two thousand years had passed away since Ictinus had stood on the heights of Bassæ surveying his completed temple; when (in 1812) a party of modern tourists, two of whom were English architects,* were led by the Greek peasants to the same spot. Searching among the ruins and rubbish that lay about the still standing columns, they discovered numerous fragments of the fallen frieze, lying in almost every case exactly under their original places. These fragments they formed the design to collect and carry off; and the necessary permission having been obtained from the Turkish authorities, they succeeded in doing so. The collected marbles were lying at Zante, when, in the year 1814, they were purchased from their discoverers by the order of the Prince Regent of England for the sum of £15,000. This sum, increased to £19,000 by other expenses, was paid by the Admiralty, and in 1815 the marbles arrived in England. Having been carefully put together and adjusted under the superintendence of Mr Westmacott, they were deposited in the British Museum.

Nos. 1—23 are twenty-three out of twenty-four slabs that formed the complete frieze above-mentioned. The slabs vary in length from 2 feet 8 inches to 5 feet 10 inches; the material is a brownish limestone, much inferior in beauty to the Pentelic marble of the sculptures from Athens. The subject represented on the first eleven slabs (Nos. 1–11) is the Battle of the Centaurs and the Lapithæ; that represented on the remaining twelve (Nos. 12–23) is the Battle of the Greeks and the Amazons. The first series of slabs, composing half of the whole frieze, was arranged from right to left round the cella; the others, composing the other half, proceeded in the contrary direction. Respecting these sculptures, a writer on the subject observes that 'they are of various degrees of merit as regards execution; but that the composition, expression, and style of art, prove that they came from a fine school of design.' 'The quality of the design,' he continues, 'warrants the assumption that the eminent sculptor (Phidias) who directed the decoration of the former great work of Ictinus (the Parthenon) may have contributed the advantage of his skill, by suggesting the fine compositions of the sculptures for his present undertaking. It is not difficult to discern in them the same sentiment and character which pervade the marbles of the Parthenon.' The resemblance here alluded to may be readily traced in comparing with the first half of the Phigalian frieze (Nos. 1–11) those metopes of the Parthenon (Nos. 1–16, Elgin Saloon) where the same subject—the Battle of the Centaurs and Lapithæ—is treated. There are, indeed, subordinate differences of costume, attitude, &c. so that the Phigalian sculptures are by no means a copy of the metopes of the Parthenon; but the conception and general handling of the subject are the same. Nor in the part of the frieze representing the Battle of the Greeks and the Amazons is the presence of a masterly hand less evident. What can be finer, for example, than the conception and expression of the bas-relief No. 23, in which four Amazons and an Athenian are represented

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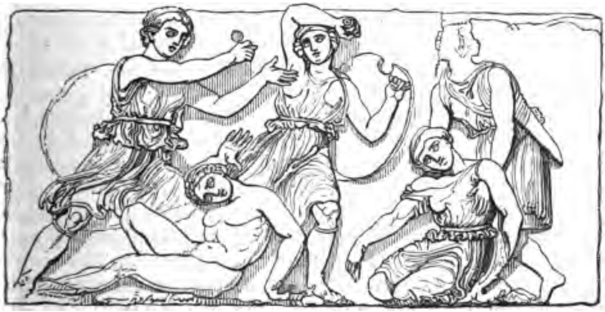
* Mr C. R. Cockerell of London, and Mr J. Foster of Liverpool.



Phigalian Frieze, No. 23.

—one Amazon about to give the final blow to a fallen Athenian, while a second implores her to desist; and on the other side a third Amazon, supporting a fourth, who seems to be mortally wounded?

Among the other fragments from the same Phigalian temple, are pieces of the metopes that adorned the front and the back (Nos. 28–38); they are much defaced, but appear to have represented single choragic figures. Besides these, there are some architectural fragments of the buildings—as No. 24, which is a fragment of a Doric capital of one of the columns of the peristyle, and No. 25, which is a fragment of an Ionic capital of one of the columns of the cella.

CASTS OF THE ÆGINETAN MARBLES.—The early importance attained by the small island of Ægina, off the coast of Attica, has been already alluded to. Although not more than 20 miles in circumference, this island was the seat of a flourishing commerce as early as the eighth or ninth century before Christ; containing a large population, and sending ships abroad over the whole Mediterranean. It was not till the year B.C. 430, when it fell under the dominion of the Athenians, that the island began to decline. Prior to that period, it had taken the lead of other Greek states even in art. Its wealth attracted strangers to it from all parts of Greece, and offered encouragement to pursuits for which there was no room except in commercial communities. The first Greek coinage, it has been already mentioned, was that of Ægina; and though the Æginetans themselves were generally disliked, on account of their money-making propensities, so celebrated was their school of sculpture prior to the time of Phidias, that the word *Æginetan* came to be used by the ancients as a term of excellence denoting the perfection of that special style of art which was in practice throughout Greece before the days of the great Athenian.

To afford room for a population so large as that indicated by Aristotle, when he computes the number of slaves in Ægina to have been 470,000, we must suppose nearly the whole island to have been at one time built upon. One Æginetan building, however, was particularly famous over Greece, the temple of Jupiter Panhellenius—that is, the Jupiter of all the Greeks—erected on an eminence in the north-eastern quarter of the island. This temple, the very name of which betokens the commercial character of the Æginetans, must have been built at least previous to the year B.C. 563; for in that year the Æginetans erected a temple to the same god in Egypt, where they had established a trading factory, and it is almost necessary to suppose that the edifice at home was built first. The temple was what is technically called hexastyle, peripteral, and hypæthral, of the Doric order—that is, it had six columns at each end, had also columns (twelve in number) on each flank; and internally it was supported by two rows of columns, the space between which was open to the sky. The temple fronted east and west; its greatest length was about 100 feet, and its breadth about 50 feet; the columns of the peristyle were 3 feet 2·9 inches in diameter, and 17 feet 9·4 inches high; the whole height of the temple from the floor to the top of the pediment was 35 feet 8 inches. The only decorations of the edifice seem to have been the sculptures of the two pediments, which were executed doubtless by the best Æginetan artists of the day. The material used for the building was a fine white limestone found on the island; the sculptures were of Parian marble, partly painted.

This famous temple, which possesses peculiar interest both for the architect and the sculptor, as exhibiting their respective arts in a more ancient stage than that illustrated by the Parthenon, and the majority of Greek remains, appears to have been laid in ruins by an earthquake long after the island, of which it had been the pride, had been stripped of all other signs of its former greatness. A few columns standing amid fallen blocks and rubbish were all that remained of it in the beginning of the present century. 'These ruins,' says the museum synopsis, 'were visited in 1811 by Mr Cockerell and other gentlemen (the same who explored the ruins of the Phigalian temple), and extensive and careful excavations were carried on, by which all the members and details of the cornice and mouldings have been ascertained. The greater part of the statues which adorned the pediments were at the same time discovered, and every circumstance illustrative of their original position with relation to the architecture of the temple was noticed with as much accuracy as the case would admit.' The English government of the day neglecting the opportunity of acquiring the sculptures that had been discovered, they were purchased by the crown-prince, subsequently the king, of Bavaria, and by him removed to Munich. Most of the statues were mutilated; but such of them as were capable of repair were committed to the hands of the great sculptor Thorwaldsen, who, in uniting the broken fragments, and restoring the parts of them that were deficient, showed the greatest skill and sagacity. For a considerable period the British Museum was without even a set of casts of these valuable marbles; recently, however, this deficiency has been repaired, by the addition to the museum of a restored imitation of the two pediments, as they may be supposed to have originally appeared, with the exception only of some missing statues of the eastern one. This imitation is almost exactly a copy of one composed by Mr Cockerell, one of the discoverers of the marbles.

The pediments are thus described in the synopsis:—'The pediment at the north side of the room is taken from the western end of the temple; it contains ten figures, and it is supposed that there was originally one more. The subject is supposed to be the contest between the Greeks and Trojans for the body of Patroclus. Of the figures which adorned the other pediment only five now remain, and the loss of the rest is the more to be lamented, as the sculptures on this eastern end are of a much higher character than those of the western. From the few figures which are still spared to us, it appears that the subject was similar to that of the other pediment, modified only by the taste and skill of the artist.' In both groups the central figure was a statue of the goddess Minerva standing upright in a calm and dignified attitude; on each side of this statue were figures of warriors combating, in various positions, some with greaves and body armour, but the greater part naked, with the exception of the head. The figures seem to have been identical in both groups, but taken at different moments of the action. Regarding the style and execution of the sculptures, the author of a paper on the subject in the 'Penny Cyclopædia' makes the following remarks:—'There is nothing in the combination of sculpture and architecture more admirable than the manner in which the various actions and attitudes have been adapted to the situations which they occupied; they are all natural and graceful, and in perfect keeping with the design of the subject and the character of the architecture. The energy of action, the grace of attitude, and the truth of proportion, displayed in these works are also admirable, and the expression of many of the figures is excellent. Nevertheless, there is a degree of dryness and rigidity observable in the bodies and limbs, which give the works an archaic character; whilst the countenance, the hair, and the draperies, clearly betoken their near approach to the archaic period. The faces are entirely devoid of expression; the hair is formally laid in tiers with convoluted ends; and the draperies, though not devoid of grace, are heavy and monotonous.' It is on comparing these Æginetan sculptures with the sculptures from the Parthenon, that one sees the advance made in art by Phidias and his contemporaries.

CASTS OF THE SELINUNTINE MARBLES.—Somewhat older still than the Æginetan marbles are certain marbles that were found among the ruins of two temples on the site of the ancient Sicilian-Greek city of Selinus. This city, which, after Syracuse and Agrigentum, was perhaps the most important of the Greek colonies in Sicily, was founded B.C. 620, was taken and sacked by the Carthaginians B.C. 409, and was finally destroyed about a hundred and forty years later. The temples amid whose ruins the sculptures were found must have been built at a very early period of the existence of the city, probably about B.C. 600. The architecture and sculptures, therefore, are examples of the most archaic style of Greek art; the only older known specimen of Greek sculpture being a bas-relief of two lions, cut on a large block of stone in the portal of the ancient town of Myceræ. The sculptures from Silenus consist of four metopes, three of which are from one temple, and the fourth from another. They were discovered in 1823 by two Englishmen, Messrs Angell and Harris; the originals were deposited by the Neapolitan government in the museum at Palermo, but a set of casts has been presented to the British Museum by Mr Angell. The metopes represent the following subjects:—Hercules and the Cercopes or thieves of Ephesus, whom, because they endeavoured to rob him, he bound and carried away hanging head downwards from his bow; Perseus, assisted by Athene, killing the Gorgon Medusa, out of whom leaps Pegasus; a female divinity who has killed a giant; and a figure in a quadriga. 'In these sculptures,' says Sir Henry Ellis, 'there is a dry hardness of manner, not without expression; the general attitudes of the figures are simple; the bodies disproportionately short, and the waists much contracted; the heads and upper parts of the bodies appear as viewed in front, while the legs and feet are generally shown in profile. The eyes are large and fixed, and there is a peculiar expression in the mouth; the hair is long and plaited, falling down in front over the shoulders. The execution of the hair is extremely formal, nearly approaching to the manner in which it is represented on Egyptian statues.'

BAS-RELIEFS FROM THE MAUSOLEUM OF HALICARNASSUS.—The word Mausoleum, now applied to any large sepulchral edifice, was originally the name of one particular tomb—that erected in the year B.C. 353 to the memory of Mausolus, king of Caria, by his widow Artemisia. This magnificent structure, which stood at Halicarnassus, the capital of Caria, was accounted one of the wonders of the world. From the description given of it by Pliny, it appears to have been a pyramidal monument erected on a base nearly square in plan, and surrounded by a peristyle of thirty-six columns. The larger side of the base measured 113 feet, the less side or front 93 feet; the columns were 60 feet high or more, and the whole height of the monument from the base to the apex was 140 feet. The architects were Pheteus and Satyrus, and the numerous sculptures that decorated the monument were by five of the most celebrated artists of the day—Pythis, who made a marble quadriga that was placed on the apex; Scopas (or, according to some authorities, Praxiteles), who sculptured the eastern side; Bryaxis, who sculptured the northern; Timotheus, who sculptured the southern; and Leochares, who sculptured the western. All these artists were of the later Athenian school. Of their contributions to the monument there now remain but eleven bas-reliefs deposited in the saloon beneath the Phigalian frieze. These bas-reliefs are evidently the work of at least two different artists, but of which two out of the five it is impossible to say. The subject is the battle of the Greeks and Amazons, and Hercules is figured among the combatants. The history of the sculptures is thus given in the museum synopsis:—'In A.D. 1522 they were discovered amidst a heap of ruins, and employed by the knights of Rhodes in the construction of the castle of St Peter at Halicarnassus, now the fortress at Boudroum, in the walls of which they remained encased till their removal in 1846, when they were presented by the Sultan Abd-al-Mehyd to Sir Stratford Canning, her Majesty's ambassador at Constantinople, and by him to the British Museum.' Besides these bas-reliefs from the Mausoleum, there are in the Phigalian Room one or two other pieces of sculptures from the same neighbourhood.

MISCELLANEOUS GREEK AND ROMAN SCULPTURES—TOWNLEIAN COLLECTION, &c.

The sculptures hitherto described have been such as have come, a greater or less number together, from special localities, with which, accordingly, they stand associated by the very name given to them—the Phigalian sculptures, for example, meaning the sculptures that have been brought from the site of ancient Phigalia; the Æginetan sculptures, those that have been brought from Ægina; and so on. But in addition to these collective groups of objects, the museum contains a great number of isolated statues and sculptures, many of them masterpieces—anonymous relics which, having been dug up, some in one spot, some in another, in the countries once governed by the Greeks and the Romans, have passed from hand to hand until collected as we now see them. These are arranged, a few of them in the Phigalian Saloon, and a considerable number in the long entrance gallery, called Room I. in the catalogue; but the greater proportion in the apartment designated the Grand Central Saloon—namely, the large hall between the Egyptian Saloon on the one side, and the Phigalian and Elgin Rooms on the other. Before pointing out such of these detached statues and sculptures as seem individually best worthy of notice, it may be well to give an account of the manner in which this and other such collections have for the most part been formed.

The proportion of the ancient statues and busts that have survived to modern times, either by remaining in their original places, or by being transmitted in the regular way from generation to generation, is very small. Of the myriads of statues, for example, that once adorned the city of Rome, only six were left standing at the beginning of the fifteenth century. The ancient statues and busts, therefore, which now form the wealth of so many collections throughout Europe, have been all but universally procured by one process — that of excavation, either casual or intentional, on the sites of ancient villas, gardens, baths, &c. One of the first persons who in modern times systematically undertook excavatioms for the purpose of recovering statues and bronzes of ancient workmanship, was the Florentine Poggio Bracciolini (born A.D. 1380, died A.D. 1459), one of the most distinguished scholars of his time, and one of the most active agents in the revival of classic literature in Europe. 'Whenever,' says one of his biographers, 'the avarice or the curiosity of his contemporaries prompted them, during his long residence in Rome, to search into the ruined magnificence of their ancestors, Poggio attended the investigation, anxious to recover from the superincumbent rubbish some of those breathing forms, the offspring of Grecian art, which the rapacity of Roman imperators had selected from amongst the spoils of Greece. Nor did he confine these researches to the precincts of Rome: the neighbouring districts witnessed his zeal for the restoration of the monuments of ancient sculpture. With this interesting object in view, he visited Crypta Ferrata, Tusculum, Ferenterium, Alba, Arpinum, Alatrinum, and Tiburtum. His inquiries after specimens of ancient art were also extended into distant countries.' Encouraged by the example and advice of Poggio, other eminent Italians became collectors, among whom the most zealous was the celebrated Cosmo de Medici. It was in the cabinet of ancient sculptures founded at Florence by Cosmo de Medici, and increased by his successor Lorenzo, that Michael Angelo and other great Italian artists of his day pursued their early studies, and accordingly 'to this institution,' says Sir Henry Ellis, 'more than to any other circumstance, we may ascribe the sudden and astonishing progress which, towards the close of the fifteenth century, was made in the arts, and which, commencing at Florence, extended itself to the rest of Europe.' As was natural, it was in Italy that collections of ancient sculpture were first multiplied. Popes, cardinals, and princes vied with each other in founding galleries of antiquities; and hence, besides the original Florentine museum, Italy soon contained other similar collections, such as the Belvedere Collection in the Vatican, begun by Pope Julius II. (1503–1513); the Borghese Collection, begun by Pope Paul V. (1566–1572); and the Barberini Collection, begun by Pope Urban VII. (1623–1644). Among the masterpieces that graced these early collections, were an equestrian statue of Marcus Aurelius, found A.D. 1480 in Rome, near the church of St John Lateran; a torso of Hercules, found somewhat later in the Campo de Fiori; the famous group of the Laocoon, found in 1512 in a vineyard near the baths of Titus; the equally famous Venus de Medici, found about the same time in the portico of Octavia, and so named after the reigning pope, Leo X., who was of the Medici family; and the Apollo Belvedere, found during the pontificate of Paul V. in the ruins of Nero's palace at Antium, about forty miles from Rome.

In France and Spain collections were soon formed similar to those existing in Italy. Nor was England without men of taste to set the example of a liberal zeal for the acquisition of works of ancient art. In the reigns of James I. and Charles I., the chief collectors were the Duke of Buckingham and Lord Arundel. The latter nobleman especially was indefatigable in his search after antiques, and collected during his life, either through agents, or by his own personal exertions, a great number of ancient statues, bas-reliefs, bronzes, coins, and other works of art. This collection was dispersed in 1678, and helped to form the two celebrated private collections of the Pembroke and Pomfret families. During the eighteenth century collecting ancient sculptures became quite a fashionable occupation. Among the men of rank and wealth that indulged in it most conspicuously, were Dr Mead, Sir Robert Walpole, the Earl of Leicester, Lord Charles Egremont, the Earl of Carlisle, the Earl of Shelburne, afterwards Marquis of Lansdowne, Mr Weddell of Newby in Yorkshire, the Hon. J. Smith Barry of Beaumont in Cheshire, and Henry Blundell, Esq. of Ince-Blundell in Lancashire. By all of these gentlemen collections of greater or less extent were formed, some of which are still extant in different parts of England.

But perhaps the most zealous collector of antiques ever known in this country was the founder of the collection now in the British Museum—Charles Townley, Esq. of Townley in Lancashire. Born October 1, 1737, and having lost his father when only in his fifth year, he was sent by his guardians to be educated at the college of Douay in France, then the resort of young English gentlemen of Roman Catholic families. After having spent his youth in France, he returned to England in 1758 to take possession of the family estate, but again went back to the continent. 'In or about 1765,' says Sir Henry Ellis in a sketch of his life prefixed to his account of the Townley Marbles, 'he visited Rome and Florence, resumed his literary pursuits, studied with critical exactness the works and principles of ancient art, and finally determined to indulge his taste in forming a collection of ancient sculpture. During this period of his life he resided mostly at Rome; from whence, in different excursions, he visited the most distant parts of Magna Græcia in Sicily. The strong attachment of his family to the cause of the Pretender insured for Mr Townley, upon his arrival in the pontifical city, an easy introduction into the best society, and gave him unrestrained access to the cabinets and galleries of the Roman nobility. His growing love of the arts was excited by these opportunities, his knowledge confirmed, and his taste perfected by conversation with the literati whose works had gained them so much fame. He knew and discussed the opinions of Winckelmann, Dr Hancarville, and others, before they were committed to the press; with Sir William Hamilton, too, he entertained a constant intercourse.' His chief agents in collecting works of ancient art were Mr Gavin Hamilton, an artist of distinction then residing at Rome, and Mr Thomas Jenkins, an English banker in the same city. Through their means, and by his own exertions, he gradually accumulated a most valuable cabinet of genuine Greek and Roman sculptures. With this he removed to London about the year 1772, still keeping up a correspondence, however, with his agents in Rome, that additional sculptures might from time to time be forwarded to him. The remainder of his life was spent in England. 'Having purchased,' says his biographer, 'a house in Park Street, Westminster, he there exhibited his stores of Greek and Roman art, with an arrangement classically correct, and with accompaniments so admirably selected, that the interior of a Roman villa might be inspected in our own metropolis. He allowed a most liberal access to all those who were known in the literary circles as men of taste or as antiquaries, and never disappointed the curiosity of others. It was delightful to see him frequently joining himself to these visitants; and when he found them desirous of more information than the parlour catalogue contained, freely entering into conversation, and, with a gracefulness of manner peculiarly his own, giving a short dissertation upon any piece of sculpture under consideration. A select few were sometimes assembled at his table. The dining-room in Park Street was spacious, the walls and columns were wrought in scagliola, to resemble porphyry, and the largest and most valuable statues were placed around. Lamps were placed so as to form the happiest contrast of light and shade, and the improved effect of the marbles amounted by these means almost to animation. To a mind replete with classical imagery the illusion was perfect. Mr Townley enriched the conversation, naturally dictated by the surrounding objects, by profound knowledge in the arts of design, and enlivened it by pleasantry and anecdote.' Though he wrote much on subjects connected with art, Mr Townley never printed anything but one antiquarian paper—a circumstance that is in part accounted for by the difficulty he found in either speaking or writing English, after so long a residence abroad. In 1791 he was elected one of the trustees of the British Museum; and in January 1805 he died, in the sixty-eighth year of his age. By his will he enjoined his executors to complete within five years a plan that he had meditated for erecting a statue-gallery and library at his mansion of Townley; or, failing this, to make over his collection of antiques to the British Museum. His executors thought it best immediately to offer the collection to the nation; and accordingly an act of parliament was passed, purchasing all the marbles and terracottas that Mr Townley had accumulated for the sum of £20,000. An additional building was erected for their reception by the trustees of the museum, and in 1808 they were first exhibited to the public. Six years later, a farther sum of £8200 was voted by parliament for the remaining portion of Mr Townley's gallery, consisting of bronzes, coins, gems, drawings, &c. chiefly designed to illustrate the sculptures. These are now dispersed through the various departments of the museum, and some of them have already been noticed in their proper places; the marbles, however, have been kept together, and still form the largest portion of the collection of detached sculptures in the museum. Appropriately enough, therefore, a bust of Mr Townley, as the founder of the collection, finished from a cast taken after his death by Nollekens, is placed near the entrance to the Central Saloon.

The Townleian collection of sculptures, enriched as it has been by subsequent purchases and donations, now consists of several hundreds of distinct objects, the most important of which may be classed under the following heads:—1. Bas-reliefs; 2. Vases; 3. Statues and groups; and 4. Heads and busts.

BAS-RELIEFS.—Of these there is a very considerable collection in the museum, extending from the archaic period of Greek sculpture to the latest Roman times. Some are parts of friezes, some are simple votive tablets that appear to have been deposited in temples, some are portions of tombstones or sarcophagi. The collection furnishes examples of all kinds of relief from the lowest, which it was customary to employ where there was a scanty light, to the highest, which was used for situations where the light was strong.

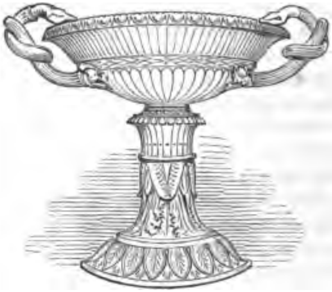
Perhaps the oldest of all the bas-reliefs in the collection is No. 7, of a series in the Central Saloon. The subject is Hercules seizing the Mænalian stag, after having, at the command of Eurystheus, king of Argos, pursued it for a whole year in the

Arcadian forest, in order to take it alive. The dimensions of the tablet are 1 foot 11¼ inches by 11¾ inches. The expression is energetic; but in the execution of the figures, and particularly in the stiffness of the hair and beard of Hercules, the antiquity of the sculpture is manifest. Considerably less ancient is the bas-relief marked No. 6 of the same series. This bas-relief, which is 3 feet 4 inches long by 2 feet 5½ inches high, represents Castor holding back a horse, with a small dog following. The sculpture is in the flat early Greek style, but the effect is very spirited. This relic, together with a number of others, was found in the ruins of Hadrian's villa on the banks of the Tiber, during the excavations that were undertaken on the site for archæological purposes, by Mr Gavin Hamilton in 1769. Other bas-reliefs of interest in the same series are—No. 1, representing a satyr struggling with a nymph; No. 4, a very elaborate bas-relief, 4 feet 11 inches long by 3 feet high, representing Bacchus received as a guest by the Athenian Icarius in the garden of a villa, on that fatal occasion when the god came to reveal the use of wine to mortals; No. 9, a curious bas-relief of later Roman times, and of very coarse workmanship, divided into three compartments—the first representing the infant Bacchus on a goat, the second a Triton attending on Venus, and seizing a marine bull by the horns, and the third a party of hunters returning from the chase; and No. 12, which is a piece of exquisite Bacchanalian sculpture, representing a Bacchante playing on a tambourine, followed by two Fauns, one playing on a double flute, and the other carrying a thyrsus, and accompanied by a panther.

Such are a few of the bas-reliefs specially marked as such in the Central Saloon; but scattered about that room without any numbers attached to them, and also ranged along the wall in Room I, the visitor who has leisure will discover many other bas-reliefs that cannot fail to interest him. In the southern recess of the Central Saloon, for example, which is devoted to Roman sepulchral antiquities, he will find numerous bas-reliefs on urns, tablets, &c. as well as those on several large sarcophagi very conspicuously placed. Among the bas-reliefs in Room I, are also numerous sepulchral tablets and parts of sarcophagi. In the first compartment of that room may be noted the end of a sarcophagus representing Bacchus leaning on a satyr; in the second compartment (upper shelf) are the front and ends of a sarcophagus very curiously carved, with representations of Bacchus and Ariadne in a chariot drawn by Centaurs, Pan receiving a flogging from a satyr, and the same god carried away by two Cupids and a satyr. In the third compartment are a piece of a large sarcophagus representing a dramatic poet seated on a chair with a muse standing before him; and on the upper shelf three other bas-reliefs from sarcophagi — one representing a funeral car in the shape of a temple drawn by four horses, with Jupiter and the Dioscuri by its side; another, Achilles detected by Ulysses and Diomedes disguised as a female among the daughters of Lycomedes; and the third a Roman marriage, the bridegroom giving his right hand to the bride, and holding the marriage contract in his left. Among the bas-reliefs in the fourth compartment are—one representing a Bacchante holding a knife in his right hand, and in his left half of a kid—a supposed copy of a sculpture by the celebrated Greek artist Icopas; another, a part of a sarcophagus, representing Priam begging the body of Hector from Achilles; and on the upper shelf, the front of a sarcophagus of later Roman workmanship, representing the nine muses in order, each characteristically sculptured. The fifth compartment also contains several bas-reliefs—one of which (upper shelf) is from the front of the cover of a sarcophagus, and represents six recumbent Amazons with their weapons.

The most valuable, however, of all the bas-reliefs in the museum, is that marked No. 23 in the Central Saloon. This bas-relief, which has been figured and described by almost every modern writer on art, represents the apotheosis or deification of the poet Homer. The dimensions of the tablet are 4 feet 6¾ inches high by 3 feet 2½ inches wide; the figures have been variously interpreted, but are arranged as follows:—At the foot of a high mountain—either Parnassus or Olympus—is represented the interior of a temple, in which the ceremony of the apotheosis is going on. On a chair on the left hand sits the father of poetry, his head bound with a fillet, and holding in his left hand a long rod or sceptre, and in his right a book; while on each side of the chair kneels a maiden—the one on the right hand of the chair representing Homer's great production, the 'Iliad;' the other the 'Odyssey.' At the back of the chair are two female figures—Chronos, or Time, and Oikoumene, or the Earth; Earth is crowning the poet with a garland, while Time holds forth the volumes that form his title to immortality. Near the cushion on which the poet rests his feet are a mouse and a frog, representing, it is supposed, Homer's burlesque poem, the 'Battle of the Frogs and Mice;' originally, however, it seems this part of the bas-relief contained not a frog and a mouse, but two mice—an emblem possibly of criticism and critics. Immediately in front of the poet is a youth representing Mythos, or Fable; and close to him is an altar with an ox or bison ready to be sacrificed; behind whom are a troop of nine figures, History, Poetry, Tragedy, Comedy, Nature, Virtue, Memory, Faith, and Wisdom, all attending the sacrifice, and adoring the deified bard. The interpretation of the whole scene is facilitated by running labels in Greek letters placed underneath the figures—as Χρονος under the figure of Time, Ποιησις under that of Poetry, and so on. Over this scene of the apotheosis, and occupying the higher parts of the mountain, are the different muses and deities of verse—first, on the right hand of the tables, an unknown personage standing on a pedestal, supposed by some to be Orpheus, by others to be the Flamen or Priest of Homer, and by others to be some eulogist of the great poet; to his right, within a cave, are seen Apollo with his attendant Pythia; above whom, in order, are the nine muses—Polyhymnia, Urania, Terpsichore, Erato, Melpomene, Euterpe, Thalia, and Clio; while, highest of all, on the top of the mountain, surveying and sanctioning the whole transaction, and listening specially to Melpomene, who appears to be addressing him, is seated Jupiter, holding a long sceptre in his right hand, and with an eagle at his feet. In the space underneath Jupiter is traced the following inscription in Greek:—'Archelaus, the son of Apollonius of Priene, made this.' As the bas-relief is clearly of late workmanship, and was found near the site of an ancient palace of the Roman Emperor Claudius at Frattochi (Bovillæ) on the Appian Road, about ten miles from Rome, it has been conjectured that it was executed by the artist Archelaus for the above-named emperor. The only circumstance in support of this conjecture, besides that of the bas-relief having been found in the particular spot mentioned, is, that Claudius is known to have been a great admirer of Homer. Dr Hancarville, however, believed the carving to be of more ancient date. It was found nearly two hundred years ago, and was for a long time in the possession of the Colonna family at Rome: in 1819 it was purchased by the trustees of the British Museum for the extravagant sum of £1000.

VASES.—The vases in the Townleian collection are almost exclusively of marble, and the greater proportion of them are sepulchral. Four seem deserving of special notice: that marked No. 2 in the Central Saloon is a funeral urn of circular shape, decorated with the representation of a battle in high relief. The combatants, who are partly equestrian, and partly pedestrian, seem to consist of Romans and Germans; the urn was therefore in all probability executed during one of the German wars, although not necessarily for a person who had actually taken part in them. The sculpture is coarse, but spirited. The urn, with some modern additions that have been made to it, measures 1 foot 11¼ inches in height; it was originally in the collection of Victor Amadei at Rome, and was acquired by Mr Townley in 1768. Of much more beautiful workmanship is the vase marked No. 7 in the same room, which was found in fragments by Mr Gavin Hamilton, during an excavation at Monte Cagnuolo, near the ancient Lanuvain, where the Emperor Antoninus Pius had a villa. This vase, in its restored state, measures about 3 feet in height; the form is most elegant, being oval, with massive upright handles; and round the body is an exquisite bas-relief, representing the Bacchanalian orgies, and consisting of a Faun, a Satyr, four male and four female Bacchantes, in various attitudes, with a panther crouched among them. Round the lower part of the body, beneath the main bas-relief, is a decorative representation of female winged figures with hands joined. No. 9, in the same room, is another vase of fine workmanship, the place of whose discovery is not known.. 'It is 2 feet 8 inches high, of an oval form, with two upright double handles, which spring from the necks of swans.' The neck of the vase is wreathed with ivy, and on the body is a Bacchanalian bas-relief, consisting of four figures—a young Faun playing on the double pipe, an older Faun carrying a wine pitcher on his shoulder, another young Faun beating cymbals, and a female Bacchante bearing a thyrsus. All the figures are dancing—two of them violently. In the centre of the saloon, and conspicuous among the sculptures, is a magnificent marble vase or tazza, brought to England in 1825, and presented to the museum by Lord Western in 1839. The height of the vase is 4 feet 3½ inches, and the diameter of the cup measures no less than 3 feet 7 inches; 'it stands on a single stem, and has handles very curiously formed of swans' necks and heads gracefully intertwined.'



Tazza.

STATUES AND GROUPS.—To enumerate all the statues and groups contained in the Townleian collection would be useless in a volume like the present; it will be sufficient to mention such as appear to be specially worthy of attention.

Room I.—Among the statues and groups placed in this room, all of which are of small size, the following may be particularly distinguished:—In front of the first pilaster is a small seated statue of Cybele, or Fortune, holding a cornucopiæ in her left, and a rudder in her right hand. In the second compartment are a swan in Egyptian red marble, 1 foot 11 inches high, found in a vineyard near Rome; and two beautiful groups in white marble of the goddess Victory slaying a bull (4 feet long, and 2 high), both discovered in the same spot with the vase No. 7 above-mentioned—namely, the site of the villa of Antoninus Pius. In the third compartment are a small statue of Neptune with a dolphin by his side, brought from Athens, and presented to the museum by J. F. Gaskoin, Esq.; a small statue of Ceres from the same place, and presented by the same person; and two small votive statues of fishermen—one, 2 feet 11 inches high, representing a fisherman with a bonnet on his head, carrying a bucket or basket on his left arm; the other, 2 feet 7 inches high, representing a brawny fisherman with his head uncovered, a rough woollen garment on, a basket of fish on his left hand resting on a support, while with his right he seems to offer some fish for sale, his mouth being open as if in the act of speaking.

Victory.

In front of the third pilaster is an exceedingly beautiful statue, 4 feet 3½ inches high, of Cupid bending his bow—a copy, it is believed, of the celebrated masterpiece of Praxiteles. The original Cupid of Praxiteles was a favourite study of the ancient artists, and numerous copies of it seem to have been made. Of these no less than thirteen or fourteen, by different hands, still exist, discovered some in one place, some in another. That they are copies of the famous Cupid of Praxiteles, appears in the first place from their number, it being unlikely that any work of inferior reputation would have been so often copied, and also from their agreement with the descriptions that remain of the lost masterpiece. Of this masterpiece the following anecdote is told, which, whether true or not, illustrates the high esteem in which it was held by ancient connoisseurs:—The Thespian courtesan Phryne, whom Praxiteles seems to have preferred as a model for his female statues, and who is said to have possessed great influence over him, wished to have one of his works given her as

Neptune.

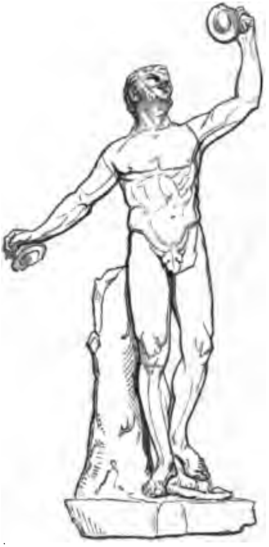
a present; not knowing which to choose, she had recourse to a trick, in order to discover which was the most valuable. She desired a servant to run and tell Praxiteles that his workshop was on fire. Praxiteles, on hearing the news, rushed out, crying frantically that 'if his Cupid and his Satyr were destroyed, all was lost.' Phryne instantly claimed the Cupid, which the sculptor, half laughingly, half grudgingly, gave her. Praxiteles, however, is said to have sculptured two Cupids, one in bronze, and one—the masterpiece—in Parian marble. Supposing this to be true, it is still likely that the copies we have are copies of the masterpiece. The one now under notice, though good, is not one of the best; it was sent from Rome by the painter Barry as a present to Edmund Burke, and was purchased for the museum on the sale of Mr Burke's marbles in 1812. The neck, both the arms below the shoulder, and parts of both legs, have been restored; the bow is also incomplete; the quiver is at the side of the figure.

Cupid.

In the fourth compartment are two statues of the kind called Terminal—the one (3 feet 10 inches high) of a hermaphrodite with the head of a female, holding in the left hand a stork, and in the right a bunch of grapes, which the bird picks at; the other (4 feet 9 inches high) of the youthful Mercury with his winged cap on. The Hermæ, or Terminal statues of the ancients, of which there were such numbers, were all on the model of these two—that is, consisted of heads and busts (sometimes portraits) placed on square columns. Dr Millingen, in his 'Ancient Unedited Monuments,' thus explains the origin of both names:—'The custom of representing Hermes, or Mercury, by a head placed on a cube or quadrangular pillar of wood or stone, is generally known. It was so frequent at Athens, that the name of *Hermes* became generic, and was applied to all figures of this kind, though the heads were of other divinities or personages. These Hermæ were placed in great numbers before the doors of temples and of private houses, at the corners of streets, on the high roads, and as landmarks in the country, from which last use their name of *Terminal* is derived. They were held in extreme veneration as objects of worship, and sacrifices and libations were daily offered to them.' Of the two Hermæ or Termini under notice, the former was found in 1774 in a swamp near the Lake of Nemi; the latter, which is possibly the portrait of some boy in the form of Mercury, was found in 1770 at a spot near Frascati. In the same compartment are several other objects of interest. A beautiful group, 2 feet long by one foot 11 inches high, representing two dogs of the greyhound breed at play—one of the numerous antiques found at Monte Cagnuolo; a curious statue of an Egyptian or Numbian tumbler, practising his art on the back of a tame crocodile; and a statue 2 feet 6 inches high of Diana Triformis, or the Three-bodied Diana, usually called Hecate, and sometimes also Trivia, because such statues of the goddess were set up where three ways met. On the base of the Hecate is this inscription: 'Ælius Barbarus Augustorum libertus Vilicus hujus loci D. D. P.' —that is, 'Ælius Barbarus, freedman of the emperors, bailiff of this place, erected this statue to Diana.' The statue was imperfect when found, and has been partly restored.

In front of the fourth pilaster is a torso, apparently of Mercury; and in front of the fifth is a small statue of the infant Bacchus, about three feet high, the head crowned with ivy, and the body clothed with the skin of a goat. This little statue was found at Monte Cagnuolo. In the compartment between the two pilasters is a very curious Mithraic group, as such sculptures are called, 'representing a youth in Phrygian or Persian attire, sacrificing a bull, with the usual accompaniments of the scorpion, serpent, and dog; and two smaller figures in Phrygian attire, one with an inverted torch, and the other holding up the tail of the bull. Near the bull's hind feet are the remains of those of a raven; and the statue is inscribed on both sides with a dedication to the god Mithras by Alcimus, a farm-servant of T. Cl. Livianus.' The word *mithra*, *mitra*, or *mitras*, was originally the Persian name for the sun, to which luminary, according to the religion of Zoroaster, divine honours were paid. This worship, together with mystic rites that were associated with it by the later Persians, was transferred into Asia Minor, and on the conquest of that country by the Romans, was incorporated in a clumsy way with the Roman polytheism. What was the exact nature of the Roman mithraic rites, which are said to have been always celebrated in grottos and caves, can hardly now be ascertained, although dissertations have been written on the subject; but all the representations of them in statuary that remain contain the symbols above-described, with some variations in the grouping, and sometimes with the omission of the two attending figures. The sacrificing of a bull, therefore, appears to have been the chief part of the ceremonial. The group in question is of somewhat coarse material and workmanship, 3 feet 6 inches long, and 2 feet 6 inches high.

Phigalian Saloon.—On the floor of this saloon stand several of the finest statues in the museum. In one of the corners is a much-admired torso of Venus—a fragment of a restored statue that belonged to the Duke of Richmond, and was broken to pieces in a fire that happened at Richmond House, Whitehall, on the 21st of December 1791. Not far from this torso is a broken statue of Hymen, the god of marriage—represented as an effeminate-looking young man with long hair encircled by a wreath of flowers. The statue was discovered in 1817 among the ruins of an old Roman house in the Via Appia, not far from Rome, and was bought by the trustees of the museum in 1831 for £30. Of much higher character is the Rondinini Faun, as it is called—a statue of a satyr playing the cymbals, formerly in the collection of the Rondinini palace at Rome. It was sold by the Marchese Rondinini to an Englishman, and was brought to this country in 1826, in which year the trustees of the museum purchased it for £350. The dimensions are those of life; but a great part of the statue is modern, only the torso being antique.



Satyr.

Close by this fine statue is one still finer—the celebrated Discobolus, or quoit-thrower, believed, on evidence almost indubitable, to be a copy of one of the masterpieces of the sculptor Myron. This masterpiece, which was in bronze, was an especial favourite with the ancients. Quintilian eulogises it, and the Greek writer Lucian, who was himself bred a sculptor, describes its character in these words:—'Bending forward in the attitude of throwing, with the head turned back towards the hand that holds the discus (quoit), one knee gently bent, the figure appears ready to rise as soon as it has discharged the discus.' Thus admired, the Discobolus of Myron, like the Cupid of Praxiteles, was frequently copied in marble. Several ancient copies, in a more or less perfect condition, are still in existence; and among these undoubtedly the finest is that now under notice. It was discovered in 1791 'in the grounds of the Conte Fede in the part of Hadrian's Villa

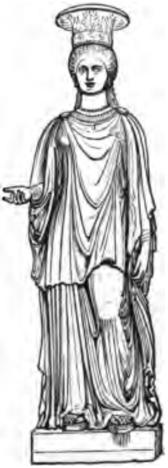
Tiburtina, supposed to have been the picture gallery.' The following is the notice of it in one of the volumes on ancient sculpture published by the society of Dilettanti:—'This is unquestionably the best of the ancient copies extant of the Discobolus, or quoit-thrower of Myron, the statue most celebrated among the masterpieces of Grecian art for its accurate display of technical skill and science in representing a momentary and violent action of the human body, for which the artist could have had no stationary model to assist his memory. The surface of it, however, has been in many parts corroded and repolished; and the head is quite different from that of the original and the other copies, in which the face is turned back towards the quoit, as it naturally would be on such an occasion. (See Lucian's description above-quoted.) Its late proprietor, Mr Townley, nevertheless, thought that the head originally belonged to it, though it had been broken off, and rejoined to the neck by an intermediate piece inserted. We wish we could discover sufficient grounds in the action and disposition of the adjoining muscles for acquiescing in this opinion, and believing that the deviation proceeded from an attempt of the copyist to improve upon his archetype; but our duty obliges us to acknowledge that the head appears to us to have belonged to a totally different figure, and to have been put upon this by a modern restorer, under the direction of Mr Jenkins the dealer, through whose hands it passed at Rome.' Mr Barry the painter was a great admirer of this statue, and defended the deviation from the original here commented on. 'Besides its admirable expression of the subject,' he says, 'many views of its lower limbs, and their sublime proportions, call to one's recollection the noble style of Annibal Carrache in the Farnese gallery.' The left hand of the statue is a modern restoration.

The only other statues in the Phigalian Saloon that need be noticed are one of Ceres, or of Isis in the character of Ceres (four feet eight inches high, including the plinth), draped from head to foot, with a basket or censer in the left hand, and fruit in the right; and one, also draped, of Libera (the female Bacchus), or of Ariadne, with a panther at her feet, and holding a thyrsus over her right shoulder, and a bunch of grapes in her left hand. The former once belonged to the Macarani collection at Rome; the other was found by Mr Gavin Hamilton at Roma Vecchia near Rome. The head of the Ceres, which has been transferred to it from some other figure, is disproportionately large.

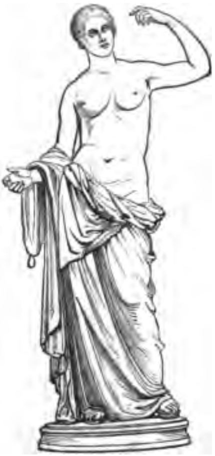
Central Saloon.—Taking the statues in this saloon (which are not regularly numbered) in the order in which they follow each other in the authorised catalogue, the first that appears to deserve special notice is a small statue on the north side of Cupid or Somnus (the sleep god) lying asleep on a lion's skin. The expression of this statue is exceedingly pleasing: the little god lies with his plump limbs crossed, his head leaning on his left arm, and touched by his right; his wings spread; his bow and quiver behind him; a club, apparently that of Hercules, before him; and two lizards creeping close to him, one near his feet, the other at his left hand. The plinth on which the figure reclines is 3 feet 2 inches long by 2 feet wide. The statue was found in a vineyard near Rome, and was once in the Albani collection. Various explanations have been given of the association of the lizard with Cupid as Somnus in this and other statues. According to one of these, it was a device for perpetuating the name of the original sculptor Saurus; the Greek word *sauros* meaning a lizard. Against one of the columns, on the west side, and at a little distance from the Cupid, is a large marble statue of Venus preparing for the bath, presented to the museum in 1834 by King William IV. The figure is in the attitude of the Venus de Medici, and various other statues of the same goddess. The whole height of the statue, plinth included, is 6 feet 10 inches.

Against another pillar on the west side is a large statue of the Emperor Hadrian, 7 feet 1¼ inches high including the plinth, and 6 feet 9¼ inches high without the plinth. The emperor is represented in Roman military dress, with a highly-ornamented breastplate; his head is uncovered; his arms and legs bare; his right hand raised as if he were making an address; a short sheathed sword in his left hand, and a cloak or scarf wound round his left arm. Hadrian, whose reign lasted twenty-one years (A. D. 117–138), was one of the best of the Roman emperors, superior in some respects even to his excellent predecessor Trajan. He was a man of extraordinary versatility of genius; and it has been remarked that he was the first Roman emperor who understood his real position as the governor of the civilised world, and not merely as the sovereign of Italy. He spent his reign in travelling from province to province of his vast empire; and from Egypt to Scotland, there was probably not a single province which he did not visit. His reign was one of profound peace. Besides being a thoughtful politician, he was a man of literary and artistic tastes, and many of the finest marbles of modern collections (including several in the British Museum) have been dug out of the ruins of a splendid villa he had built on the banks of the Tiber as a receptacle for works of art. Where the statue of him now under notice was found is unknown; it was purchased for the museum from Mr Millingen in 1821.

On the other side of the saloon from the statue of Hadrian is a fine recumbent statue of a satyr, restored. In the restoration the satyr is represented as if intoxicated; but, according to the catalogue, 'the propriety of this restoration is much doubted.' In the centre recess is a mithraic group, somewhat resembling that in Room 1 (see above). In this group, however, the two attendant figures are wanting. The youth in a flowing Oriental tunic, and with the usual mithraic cap, is represented in the act of stabbing the bull, pressing on the animal with his left knee, and holding him by the nostrils with his left hand; a dog and serpent are raising themselves to lick the blood, and a scorpion is seen beneath. The group is supposed to involve some astronomical meaning; and various explanations of the supposed meaning have been given not at all satisfactory. Its dimensions are 4 feet 10 inches in length, and 4 feet 4 inches in height; it was brought from Rome by a collector in 1815, and purchased for the museum in 1826 for £300. The workmanship is much finer than that of the mithraic group in Room 1. After this mithraic group, the next statue in the list is that of the sleeping Mercury, or Endymion, found, with other sculptures, at Roma Vecchia among the ruins of a villa supposed to have belonged to the nurse of the Emperor Domitian. The figure is almost naked, and represents a beautiful and effeminate-looking youth, a cap tied over his chin, and his arm enfolding his head.

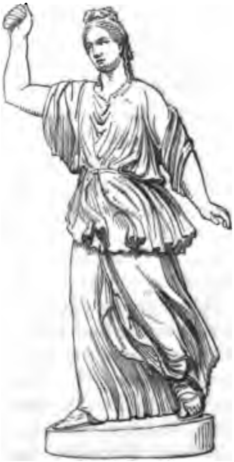

Caryatidis, No. 4.

A statue well worthy of attention is that marked No. 2*—an Apollo of very early Greek workmanship. As in most archaic sculptures, the muscles are prominent, and the veins strongly-marked; the head also is disproportionately small, as if to increase the seeming strength of the torso. The whole of the right arm below the elbow, and the left hand and wrist, are gone; the left hand seems to have held a bow. The size is that of life; the height of the figure, exclusive of the plinth, being 5 feet 9½ inches—which, however, would be tall for a Greek. The statue, which was bought for the museum in 1818, formed part of a collection of sculptures belonging to the Comte de Choiseul Gouffier, once French ambassador at Constantinople. No. 4 is an architectural statue 7 feet 10 inches high—one of the caryatides that supported the portico of some tomb or small temple, probably a temple of Bacchus. It was discovered, with another of similar form and dimensions, during the pontificate of Sextus V., among some ruins in the Villa Strozzi on the Appian Road. The statue is nearly perfect, and is of very good workmanship: it represents a female figure of dignified aspect, fully draped, and with a modius or cylindrical cap on the head, serving as a capital to support the portico. No. 5* is a statue (5 feet 7 inches high, including the plinth) of Thalia, the muse of comedy and pastoral poetry, holding in her right hand the *pedum* or shepherd's staff. The figure is fully draped, but so thinly in some places, as to disclose the form: the head is bound with ivy. The statue was discovered in 1776 by Mr Gavin Hamilton in the ruins of the maritime baths built by the Emperor Claudius at Ostia, near the mouth of the Tiber. At the same place, and at the same time, was discovered a statue deservedly regarded as one of the gems, if not the gem, of the Townleian collection—that of Venus or Dione (the mother of Venus) marked No. 8. The figure is naked to below the waist; the lower part is draped; the right arm gracefully supports the drapery, while the left is lifted towards the head. The statue consists of two pieces of marble, the junction of which is hidden by the drapery; the only restorations are the left arm, the right hand, and the tip of the nose. The execution is superb. Mr Payne Knight believed that this must be the original Venus of the sculptor Icopas mentioned by Pliny. Canova pronounced it the finest female statue he had seen in England. The height, including the plinth, is 6 feet 11½ inches; the plinth is 4⅝ inches high.



Venus or Dione.

No. 8* is a beautiful group representing the story of Bacchus and Ampelus. Ampelus, according to the Greek mythe, was the son of a nymph and a satyr, and the chief favourite of Bacchus. The youth having been killed by a fierce bull whose back he had been rash enough to mount, the god was inconsolable. To alleviate his distress, Atropos metamorphosed the dead body of Ampelus into a living vine-tree—a plant till then unknown to Bacchus, but which thenceforward became dear to him. 'The figure of Bacchus,' says Mr Combe, in describing this group, 'is youthful, and possesses that roundness of limb and delicacy of contour which more particularly characterise the forms of the female sex. A chaplet of ivy encircles his head, and he is also crowned with a broad diadem which passes across his forehead; his shoulders are covered with the skin of a leopard or tiger; and he has sandals on his feet. His attitude is graceful and easy; and his countenance is inclined towards his companion, whom he appears to regard with an expression of great benignity. The figure of Ampelus is represented at the period of his transformation into the vine-plant, but before the metamorphosis has been quite completed. The lower part of his body appears to have taken root, while 'the transformation, which is gradually proceeding, has not deprived him of the power of looking up affectionately at his master, to whom he is offering grapes. The skill of the sculptor has blended together the animal and vegetable forms with so much ingenuity, that it is difficult to decide where the one begins or the other terminates. At the feet of Ampelus, or rather at the root of the vine, is a panther, intent upon stealing the grapes, the flavour of which he is already tasting. A small lizard is running up the stem of the vine.' This group, which, including the plinth, is 4 feet 10¼ inches high, was found in 1772 near La Storta about eight miles from Rome. The right arm of Bacchus is a restoration. In the same spot with this group was found the next statue in the list, that marked No. 11*—a draped statue of Diana, of which the right arm, part of the left, both feet, and part of the right leg, are restorations. The head is of a separate piece, and is inserted into the body. From the action of the drapery, which seems blown by the wind, it is probable that the artist meant to be represented the goddess in the chase, perhaps holding a bow in her left, and shooting the arrow with her right hand. If so, the restorations are erroneous. The height of the statue, plinth included, is 6 feet and ¼ inch.

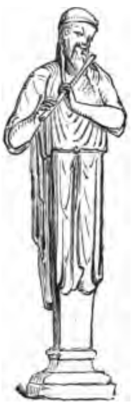


Diana.

No. 18 is a small statue (3 feet 1 inch in height, plinth included) of the goddess Fortune, found near the Via Latina, at a short distance from Rome. It represents the goddess draped, with a modius (a cylindrical cap or hat, so called after a Roman measure, the modius, which it resembled) on her head, holding in her right hand the rudder of a vessel, and in her left a cornucopiæ. No. 22 is a Venus of the finest style of art, found at Ostia by Mr Gavin Hamilton in 1775. It is 3 feet 6⅝ inches high, including the plinth, and represents the goddess entirely unclothed, with the exception of some drapery held between the knees, and sandals on the feet.

The arms below the shoulders are modern, and are probably incorrect in their position; the head has evidently been replaced; the nose also is modern. No. 24 is a statue of Pan, or of a laughing fawn, 3 feet 11 inches high: the arms from the elbows, and the legs below the knees, are modern restorations, quite in contradiction with the rest of the figure. No. 28 is a small statue (2 feet 1 inch high, plinth included; length of the plinth, 2 feet 6 inches; width 1 foot 11¾ inches) of a nymph of Diana resting after the chase: it was found with other relics in the Villa Verospi in the suburbs of Rome, supposed to have been the site of the splendid gardens of Sallust. No. 29 is a complete terminal statue (see explanation of this term under Room I) of the bearded Bacchus, 6 feet high, found in 1771 in an old vineyard at Baiœ, a celebrated ancient watering-place frequented by rich Romans. No. 31, which ought to be particularly interesting to the visitor, as being the first sculpture acquired by Mr Townley, is part of a group that was originally composed of two boys quarrelling at the favourite ancient game of *tali*—a game still known under the name of *dibs* in some parts of England, and which consists in a particular manner of throwing up and catching small bones, generally the joint-bones of sheep. Among the works of the celebrated Polycletus, the contemporary and rival of Phidias, was a bronze group of two boys playing at this game; it was much admired, and stood, Pliny tells us, in the courtyard of the Emperor Titus at Rome. Curiously enough, the statue now under notice was found almost exactly on this spot—namely, in the baths of Titus. Being in marble, however, it cannot be the original work of Polycletus, nor can it even be a literal copy, as the boy here is clothed, whereas in the group of Polycletus the boys were naked. The sculpture is nevertheless a fine one. As has been stated, it is but a part of the original group, only one of the boys remaining, who is represented biting the arm of his companion, which he holds with both hands. The left arm, the right wrist, both the feet, and the plinth, are restorations. The dimensions of the statue are 2 feet 3¾ inches high, and 2 feet 11¼ inches long. It was purchased by Mr Townley in 1768 from the Dowager Princess Barberini, whose ancestor, Cardinal Barberini, nephew of Pope Urban VIII, had been its original possessor.

No. 33 is a statue of a naked satyr or faun, 3 feet 9 inches high, holding in his right hand a cup or patera, and in his left a ewer. This statue and its duplicate, No. 43, are interesting as being the only statues in the collection that are inscribed with the artist's name. On No. 33 is a Greek inscription to this effect:—'Marcus Cossutius Cerdo was the maker;' on No. 43 the inscription is, 'Marcus Cossutius Cerdo, freedman of Marcus, was the maker.' A Roman citizen named Cossutius is mentioned by Vitruvius as having built the Olympian temple of Jupiter at Rome, and possibly the maker of these statues is the same person. Both statues were found by Mr Gavin Hamilton in 1775 in the ruins of the villa of Antoninus Pius near Civita Vecchia. It is a curious fact, that of all the ancient statues now in the museums of Europe, scarcely more than twenty bear the names of their sculptors; the practice of inscribing them, therefore, does not seem to have been common. At the same place with the two statues just mentioned, but four years later, was found No. 35, a terminal statue of Pan playing upon a pipe. The sculpture is a fine specimen of the ancient Greek style; it is 3 feet 3 inches high; the right arm, part of the left, and the lower part of the terminus, are modern. Another terminal statue is No. 37, representing Venus Architis (supposed to be the Assyrian Venus), or, as some say, Venus mourning the loss of Adonis. The countenance is sad, and the whole figure is enveloped in a robe or veil, wrapped closely round. The date of the sculpture, which is admirably preserved, was probably about B.C. 350; it was found in 1775 about six miles from Tivoli, near the Præneste road.



Pan.

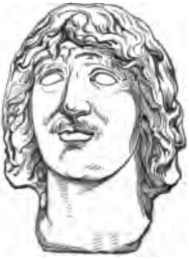
Somewhat similar in conception to the group of Bacchus and Ampelus, is the group marked No. 45, representing Actæon attacked by his dogs. The huntsman, Actæon, according to the Greek legend, had seen Diana bathing, and for this unwitting fault was changed by her into a stag, and so torn by his own dogs. The moment seized by the sculptor is that in which the transformation was commencing; stag's horns have sprouted from Actæon's head, two of his dogs ravenously seizing him, and he is beating them down with a club. The head, though ancient, seems to be a substitution for the original one; the hands, and the neck, and some parts of the dogs, are restorations. The group, which is 3 feet 4½ inches high, was found in the ruins of the villa of Antoninus Pius in 1774.

Other noteworthy statues besides those mentioned are—No. 51, a statue of a youth in Phrygian attire, either Paris, or Atys, one of the attendants of Mithras, found in 1785 on the banks of the Tiber, about five miles from Rome; an unnumbered recumbent statue of Pan; an exquisite standing Pan holding a shepherd's staff; a small statue of Diana Lucifera, wanting the head and arms, found at Woodchester in England; a beautiful torso of

Venus, from a statue representing the goddess stooping to tie her sandal; and three small statues, one (2 feet high) of Jupiter or Pluto seated with Cerberus, and an eagle by him, and holding a sceptre and a thunderbolt; another (1 foot 8½ inches high) of a seated Hercules; and the third of a comic actor seated, and wearing a grotesque mask. Nor let the visitor fail to observe a second copy of the Cupid of Praxiteles; of much smaller dimensions, but of considerably finer execution than that in Room I., already described. This exquisite little statue was found in 1775 at Castello di Guido, about twelve miles from Rome, under the circumstances described in the following note respecting it by M. d'Hancarville, the celebrated writer on art:—'Of all the copies of the Cupid of Praxiteles that I am acquainted with,' he says, 'the best, beyond comparison, is one in the collection of Mr C. Townley. It is much less than any of the others, and was found near the lake of Bracciano in the ruins of a considerable mansion. Having been enclosed in a vase of earth, it has preserved all the polish it had on quitting the hands of the artist; but, in order to get it into the vase, the owner had been obliged to take off the wings, and even to break the feet, which were found near the statue with the support on which it had rested. Not having been guarded like the rest of the statue, those parts are not so well preserved. The precautions employed to save the statue, and the promptitude with which they seem to have been taken, as if there had been no time to select a larger vase, lead me to believe that it is one of those sculptures that were concealed from the early Christians, who, in their zeal for the destruction of idols, entered even private houses and destroyed all statues of gods that they could lay their hands on.' This little gem is 1 foot 11 inches high.

HEADS AND BUSTS.—In addition to the marble heads and busts that belonged to Mr Townley, the museum now contains not a few more, some of which were bequeathed to it by the celebrated scholar and antiquarian, Mr Richard Payne Knight. A considerable proportion of the busts, and not the least interesting, are portraits of celebrated characters of antiquity. It would be an advantage, we think, and would at least greatly assist visitors in the phrenological and physiognomical comparisons in which they like to indulge, if all such heads were placed together in a series—a series which it would be very desirable to increase by the addition of good casts of all the portrait busts of ancient characters that exist in other collections. As it is, we shall enumerate the most remarkable busts, whether ideal sculptures or portraits, in the order in which they occur in the catalogue, proceeding from the Central Saloon to Room I.

Central Saloon.—Against a pilaster on the south side of the saloon is a fine bust of Jupiter or Serapis, of the heroic size, found at Hadrian's villa, and presented to the museum in 1836 by Mr Beaumont. On the same side, against another pilaster, is a head of a German prisoner, presented by the Hon. Mrs Damer. No. 1 is a colossal head of Minerva helmeted; it is 2 feet 10 inches high; where it was found is unknown; the chin, nose, and part of the helmet, are modern. No. 1* is a fine bust of Trajan, somewhat larger than life, found in the Campagna di Roma in 1776. Trajan, who succeeded to the empire A.D. 98, when he was forty-two years old, reigned about twenty years, and was probably, without exception, the best, as he was certainly one of the ablest, of the Roman emperors. The later Romans used to wish of every new emperor that he might prove 'as fortunate as Augustus and as good as Trajan.' Phrenologists remark with curiosity the extreme lowness of Trajan's forehead, as seen in every portrait of him that remains, the present bust included: the chin is also small; but to the physiognomist the face is, on the whole, extremely satisfactory; and in the important dimension of length from front to back—a dimension to which natural craniologists pay more regard than to any other—the head would doubtless be deemed a superior one. No. 3* is a head of Apollo of very early Greek work, brought from Rome by Lord Cawdor; the hair is curled in the formal manner usual in works of the Archaic period. No. 4* is an anonymous colossal head of wonderfully fine aspect and execution—the features large and commanding, the hair parted in the middle, and falling in thick masses over the brow and on both sides of the face; a moustache over the upper lip, but no beard on the chin; the whole expression that of sad and dauntless magnanimity. There can be no doubt that it is the portrait of some noted barbarian chief taken captive by the Romans, and various barbarian patriots known to have opposed the Roman arms have been named as the originals. Among these are Decebalus the Dacian, who was at last conquered by Trajan; Arminius or Herman the German, conquered by Germanicus in the reign of Tiberius, and brought as a captive to Rome; and Caractacus the Briton, of whom Tacitus says 'his name was noble even in Rome.' The probability is, on the whole, in favour of Arminius, whose age (thirty-four years) at the time of his capture would correspond with that indicated in the sculpture; possibly, however, the artist meant it not for an exact portrait, but for an ideal representation.



Colossal Head, No. 4*.

Nos. 6* and 7* are two colossal busts, both from the Mattei collection in Rome—the one a bust of Marcus Aurelius, the philosophic Roman emperor (A.D. 161–180), one of the most strict and noble men of pagan times, whose 'Meditations' in Greek exhibit him as a conscientious polytheist of the stoic sect, aiming at the highest possible purity and elevation of character; the other of his colleague and son-in-law, Lucius Verus (died A.D. 169). Aurelius is characteristically represented as one of the Fratres Arvales (that is, priests of the farms, whose office it was to walk in procession in the fields, and pray for good harvests); his hair is wreathed with corn, and a veil falls behind him: the hair on the bust of Lucius Verus, who was a debauched fop, and vain of his hair, is most elaborately curled.

Hercules, as is well known, was a favourite subject with the ancient sculptors. 'They were accustomed,' says Mr Taylor Combe, 'to represent this deified hero at four different periods of life—namely, first as an infant; secondly, as a very beautiful youth; thirdly, as a young man possessing less beauty, but having the characteristic marks of strength much more evidently portrayed in the lineaments of his countenance; and lastly, as an old man with a beard, his features bearing testimony to the series of exertions in which he had been engaged.' In the Central Saloon there are four heads of Hercules—Nos. 9*, 11, 12, and 46. That which represents the hero in the youngest stage is No. 46; a terminal head, found in 1777, near Gensano, in some grounds belonging to the Cesarini family. The countenance is so pleasing, and bears so little marks of the exaggerated strength of the mature Hercules, that it might be considered a representation of Bacchus rather than one of Hercules; the crown of poplar leaves, however, that encircles the head is peculiar to Hercules. Somewhat more advanced in life, but still young, is the Hercules of No. 9*, formerly in the Barberini palace. In this head physical prowess is strongly indicated: the neck is thick and short, the features firmly set, and the hair short, stiff, and curly. In the countenance and expression there is a likeness, evidently intentional, to the portraits of Philip of Macedon; the bust was therefore executed either in the lifetime of that sovereign, or not long afterwards. The neck, the nose, the edge of the left ear, and part of the hair above that ear, are restorations. Far more ancient than this bust is that marked No. 12. This colossal

Hercules, No. 12.

head, which was found in 1769 among the ruins of Hadrian's villa, is an admirable specimen of archaic Greek sculpture. As in the bas-relief of Hercules and the Mænalian stag, the hair is arranged in numberless little curls of stiff appearance; and the whole style is harsh and sharp, the evident object of the sculptor having been to represent an elderly man that could lift enormous burdens, or fell an ox with a blow. Of infinitely higher character as a work of art is the colossal head, No. 11, which represents Hercules in his old age, furrowed, but not worn by his toils. There we have exhibited the same bodily strength, indeed, as in the former bust; but it is the bodily strength not of a commonplace elderly pugilist or porter, but of an aged demigod. The face is more ideal, and the hair of the head and beard clusters in richer masses. This grand head—probably a copy or variation of the head of the famous statue of Hercules in repose, by Glycon, which was found in the baths of Taracalla, and placed in the Farnese collection—was dug out of the lava at the foot of Mount Vesuvius, and presented to the museum by Sir William Hamilton. It is slightly restored.

No. 12* is a fine bust of the Emperor Hadrian, the peculiarities of whose countenance—the low forehead, long under-face, and somewhat haggard aspect—may be better seen in it than in the large statue of him that stands near. Hadrian was the first Roman emperor that wore a beard; he adopted this custom, it is said, in order to conceal blotches that were on his chin; and his successors imitated it, without having the same reason. Next in the list is No. 16, a colossal head of Minerva, of very ancient workmanship, found by Mr Gavin Hamilton in the neighbourhood of Rome. This head, which was probably part of a statue executed as early as B.C. 600–500, is a fine specimen of archaic sculpture. The face is calm and severe; the eyes, which are hollow, had been filled with precious stones; and there had been ear-rings in the ears. On each side of the helmet is an owl, the bird sacred to Minerva. This bust should be compared with that of the same goddess already described (No. 1), as well as with another in the saloon, unnumbered, the helmet and ægis of which (both modern) are of bronze, while the head itself is of marble. This head also seems to have belonged to a statue; the eyes, which were inlaid, are now filled with paste. The workmanship is excellent, and the features of the goddess are more deli-

Minerva.

cate than in the older bust. Nos. 17 and 19 are terminal heads of the bearded or Indian Bacchus. In the former the head of the god is joined back to back with that of Libera, the female Bacchus. No. 19 is of very ancient work; it was found in 1790 at Hadrian's villa. Other heads of the bearded Bacchus in the museum are those marked Nos. 27 and 30; the entire terminus, No. 29, has been already described among the statues. Termini of this god are very common; they seem to have formed a common ornament in ancient dining and drinking rooms. A distinct resemblance has been remarked between most heads of the bearded Bacchus and the head of the philosopher Plato as represented in ancient portraits, just as the head of Socrates has been observed to resemble that given by sculptors to Silenus. It would certainly be a curious fact if the most wonderful spiritual preacher among the Greeks really had a face like that which artists before his time had assigned to the beastly belly god, while his magnificent disciple had features like those given ideally to the god of the grape.

A very interesting portrait bust is that of the celebrated Greek physician and author, Hippocrates (No. 20). It was found near Albano, among the ruins of a villa supposed to be that of the Roman scholar Marcus Varro, who possessed, according to Pliny, a collection of no fewer than 700 such busts of eminent men. Hippocrates, 'the father of medicine,' as he is sometimes called, was born in the island of Cos B.C. 460, and died at a very advanced age, after having visited, either professionally or as a scientific inquirer, most parts of Greece, and many foreign countries. He wrote many medical works, and was regarded, both during his life and afterwards, with a veneration bordering on worship. That the bust now under notice is that of Hippocrates, is proved by its resemblance to his portraits as given in one or two extant medals. The head is bald, the features good, the expression keen and decided. Next to this bust is a very fine terminal head of the god Mercury, considerably restored (No. 21). Where it was found is unknown: it was purchased in 1812. No visitor can fail to be struck with the noble head marked No. 25—a terminal head of the poet Homer, found among some ruins at Baiæ in 1780. Various termini of this poet have been preserved, of which this and another celebrated head in the Farnese palace are the finest. Numerous coins and medals likewise exist with faces of Homer stamped on them. It is hardly necessary to say that all these likenesses are ideal. Not only do they differ among themselves, but all of them were executed long after the period assigned to Homer (about B.C. 1000, or B.C. 800), most of them, indeed, in Roman times. Enjoying the privilege of coining money, the various cities and states that contended for the honour of having given birth to Homer—Smyrna, Chios, Colophon, &c.—naturally stamped a head of the poet on their coins by way of asserting their claim; while no subject of the kind would seem more worthy to a sculptor than a bust of the father of poetry. In the head under notice the artist has succeeded admirably. The face is that of a mild and dignified old man, with hair and beard curling downwards, a band or circlet round the head. The sculptor has clearly intended to represent poetic genius in an ideal head and countenance appropriately shaped and conceived. Had he been a phrenologist, he could not have made the organ of ideality larger; in the region of that organ the temples swell out quite remarkably. Next in order (No. 26) is a head of another great Greek poet, the tragedian Sophocles, found in 1775 near Gensano, about seventeen miles from Rome. There is no doubt as to the authenticity of the portrait; but whether from the inferiority of the execution, or from some other cause, the face is, on the whole, disappointing to an admirer of the Greek Shakspeare. 'He *must* have had a finer face than that,' is the feeling with which one looks at the bust. The same disappointment will not be felt in looking at the bust that stands next on the list, that of Pericles, the contemporary of Sophocles, and the first of Greek statesmen (No. 32). Among the nicknames bestowed on this great ruler during his lifetime by the Athenian wits, one of the most popular, after that of 'Thundering Jove'—originally applied to him by the comic poet Aristophanes—was *Schinocephalus*, or Onion-head, in allusion to some extraordinary formation of skull for which he was remarkable. To hide this ungraceful peculiarity, as it was considered, the sculptors, says Plutarch, always represented Pericles with a helmet on. For this we are not now disposed to thank them, as it prevents us from judging of the onion-head for ourselves. From the present bust, which, with a duplicate of itself of later execution, was found in 1781 among some ruins near Tivoli, it is difficult to discover what can have been the peculiarity alluded to, unless, indeed, it was connected with the extraordinary depth of the head, as shown in the distance between the forehead and the nape of the neck, where the helmet confines the back hair. As it is, the bust is one of the most characteristic in the museum; and one is chiefly struck, in looking at it, with the extreme smallness of the features, and with a certain expression of weariness or severity to be seen in the face. The name Pericles is carved across the breast.

An extremely peculiar head is that of the philosopher Epicurus, the founder of the Epicurean philosophy, born in Attica B.C. 342, died B.C. 271 (No. 34). It is a high, narrow head, and represents a somewhat serious long-visaged man, not at all agreeing with the popular notion of an Epicurean. It was discovered in 1775 at Rome. No. 39 is a highly-interesting bronze head of an unknown personage. It was brought to England in the beginning of the seventeenth century, and was one of the most valuable antiques in the collection of the Earl of Arundel; thence it passed into the hands of Dr Mead; and at the sale of his effects in 1775, it was purchased by the Earl of Exeter, who presented it to the museum. It belonged originally, in all probability, to the sitting statue of some poet. For a long period it was called a head of Homer, but it does not resemble the ordinary busts of that poet either in feature or in expression. Mr Taylor Combe imagined it might be a head of Pindar; while others suppose it to represent Sophocles, whose marble bust, already described, it somewhat resembles. No. 42 is a terminal head of another eminent Greek—the celebrated Periander, tyrant of Corinth (B.C. 627), and one of the so-called 'seven wise men of Greece,' to whom certain maxims current in the Greek world were attributed. 'Industry is everything,' was the maxim of Periander. No. 44 is the head of an unknown Greek poet, once supposed to be Homer.

Epicurus.

Bronze Head, No. 39.

Other remarkable heads in the Central Saloon are Nos. 47 and 48, which are heads of Apollo, of fine workmanship; two unnumbered busts of Jupiter Serapis, one in marble, and one in green basalt; and a bust of Antoninus Pius. The visitor ought also particularly to notice an exquisite bust of an unknown lady, represented as rising from the calyx of a flower. This bust, sometimes named 'Clytie rising from the sun-flower,' was so valued by Mr Townley, that he used jocularly to call it 'his wife;' and it is related that, when obliged hurriedly to escape from a threatened attack on his house by the Gordon rioters, he ran back and brought this marble to the carriage with him. Another curious bust is that of a youth, supposed to be Atys, or Adonis, the head and breast swathed with folds of cloth, as if to represent death, and only the face exposed. But a finer sculpture than any of these is the bust entitled 'Head of one of the Homeric heroes, supposed to be Ajax.' This head, which is undoubtedly ideal, has an aspect almost modern: it represents a heroic face looking upwards with an expression of earnestness and grief. The hair is arranged in fine bold masses; the beard is quite short. This admirable sculpture, executed probably some three centuries before Christ, was discovered by Mr Hamilton during his excavation on the site of Hadrian's villa.

Adonis.

Room I.—The most remarkable busts in this room, proceeding from the innermost to the outermost compartment, are the following:—A bust of Faustina Junior, the wife of the Emperor Marcus Aurelius, and the daughter of Antoninus Pius; a bust of Domitia, the wife of the Emperor Domitian; a bust of Julia Sabina, the wife of the Emperor Hadrian; a bust of Otacilia Severa, the wife of the Emperor Philip; busts of the Emperors Augustus and Tiberius, both fine heads, particularly the former, which is remarkable for its breadth of brow; a bust of the Athenian orator Æschines, the celebrated opponent of Demosthenes, a heavy-looking good-humoured man; an ideal head of Jupiter, a supposed copy of a Jupiter sculptured by Polycletus, and celebrated for its mild expression of countenance; busts of Caracalla, Gordian the Elder, Hadrian, Nero, and Septemius Severus—the bust of Caracalla, exhibiting a head of the most ugly and brutal type, admirably corresponding with his character; a head of a laughing satyr, of very fine work; a most characteristic head of the Cynic philosopher Diogenes, phrenologically remark-

Achilles.

Demosthenes.

able for the depression it exhibits in the coronal region; a bust, apparently from a statue, of a dying Amazon; a bust of Chalus, a second-rate Greek poet, who lived B.C. 270; a fine ideal bust supposed to represent Achilles; a bust of Hercules in advanced age; a bust of a Bacchante; a bust of a muse crowned with laurel; a bust of a child; a bust resembling that of the poetess Sappho; busts of Minerva, Bacchus, Apollo, Libera; a fine bust of Diana in Parian marble; a bust of Juno, with large eyes and imperious countenance; a joint terminal bust of Hercules and Omphale; a noble head of Demosthenes (see previous page), representing him as in the act of speaking, and with that repressed appearance of the under lip peculiar to persons who stutter; and finally, an admirable bust of Julius Cæsar, representing him with lean sunken cheeks, bald forehead, and anxious careworn visage.

Julius Cæsar.

APPENDIX.

THE LIBRARY, COIN ROOM, PRINT ROOM, &c.

THE parts of the museum that still remain to be noticed are—The Collection of Portraits; the Coin and Medal Room; the Print Room; the Manuscript Room; the Library; and the Reading Room. With the exception of the Collection of Portraits, these are all comparatively private in their character. While the rest of the museum is open to the public indiscriminately, the Coin Room, the Print Room, the Manuscript Room, and the Library, can be visited only by particular permission, and by a few persons at a time; and though the attendance in the Reading Room is more numerous, those who go there go for a special purpose, and require to be specially enrolled before they can be admitted. It will be sufficient, therefore, if we add to the detailed description we have already given of the more public parts of the museum, such brief notices of these remaining portions as may serve to make our account of the institution strictly complete.

COLLECTION OF PORTRAITS: EASTERN ZOOLOGICAL GALLERY.

Along the walls of the Eastern Zoological Gallery, very inconveniently hung over the upright cases, and hardly looked at by the crowds that walk through the gallery examining the shells and the birds, are a number of old pictures, almost exclusively portraits of eminent personages. Among these, the following are worthy of notice:—two portraits of Oliver Cromwell, one (No. 3) a copy from an original that was in the possession of a great-grandson of Cromwell, the other (No. 9) an original presented by Cromwell himself to Nathaniel Rich, a colonel in the Parliamentary army, and bequeathed to the museum in 1784 by Sir Robert Rich, Bart.—

both exhibiting Cromwell as a dark-haired, swarthy-faced man, whereas, by true accounts of him, he had light or tawny-gray hair, with a sanguine or salmon-coloured visage; three portraits of Mary Queen of Scots, one (No. 11) by Cornelius Jansen; a portrait of Charles II., by Sir Peter Lely (No. 21); portraits of Richard II., Edward III., Henry V., Edward VI., Queen Elizabeth, James I., &c.; three portraits of Sir Hans Sloane, the founder of the museum (Nos. 31, 32, and 36); a portrait (No. 47) of Peter I. of Russia, a fine open young face, a copy from an original in the possession of the Earl of Hertford, English ambassador at the court of Russia in 1725; portraits of Stanislaus Augustus I. of Poland, Charles XII. of Sweden, and Louis XIV. of France; a good portrait (No. 53) of Lord Bacon, the usual calm profound face; a portrait of the Duke of Marlborough (No. 55); a portrait of Andrew Marvel (No. 57); a portrait of the poet Matthew Prior (No. 66), after an original by Richardson; a portrait of Sir Isaac Newton (No. 69); a portrait of Dr John Ray, the first great English naturalist (No. 70); a portrait, undated and unauthenticated, of Shakspeare (No. 73), the best portrait of whom, after all, is that of the Stratford bust; a small portrait on panel (No. 74) of George Buchanan, in his seventy-sixth year, or A.D. 1581; a portrait of Voltaire (No. 75); a portrait of Sir Francis Drake (No. 81); a small portrait on panel (No. 85) of Martin Luther in the sixty-third year of Luther's age, dated 18th Februry 1546; a portrait of Captain Dampier, the celebrated navigator and buccaneer (No. 89); a portrait of Rubens (No. 95); a portrait of John Guttenberg, the inventor of printing (No. 97); a portrait of John Locke (No. 99); a fine portrait of the poet Pope at an earlier period of life than that at which he is represented in the usual portraits (No. 108); a portrait of the Earl of Chesterfield (No. 110); and a portrait of Richard Baxter (No. 111). Several small portraits that once hung in the same gallery, including an original of Chaucer, taken in 1400, and a limning of Frederick III. of Saxony by the celebrated Lucas Cranach, have been transferred to the Print Room.

PRINT ROOM.

This room is situated in the same part of the museum as that devoted to the collection of antiquities, and is accessible by a door on the staircase leading from the Egyptian Saloon to the Egyptian Room. In the passage leading to the room are hung a number of Egyptian papyri framed and glazed; the room itself is occupied with the valuable collection of modern prints and drawings, for the most part bound in volumes, and deposited horizontally in cases arranged round the walls. This collection consists of the prints and drawings bequeathed to the museum in 1799 by the Rev. C. M. Cracherode, of those bequeathed in 1824 by Mr Payne Knight, and of numerous smaller bequests and donations. It is only recently that the trustees of the museum have expended money in purchases for this department, which, however, is now becoming richer and more valuable every day.

Among the drawings contained in the collection are one or two superb originals by Rubens; a fine assemblage of drawings of the early Italian school; 272 original drawings by Claude Lorraine; numerous drawings of the Dutch school; several hundreds of drawings by Albert Dürer and other early German masters; besides many volumes of botanical and architectural drawings of great value, and drawings from antique sculptures, gems, &c.

The prints are arranged for the most part in schools—the Florentine school, the Roman school, the early German school, &c.—and at present steps are being taken for perfecting this arrangement, by bringing together all the works of each particular master in his proper order. Among the more important items in the general collection may be mentioned beautiful sets of the works of Marten Schoen, Albert Dürer, and other early German artists; extensive and almost complete sets of the works of Marc Antonio, the early Italian artist, of Rembrandt, and of Hollar; and splendid collections of Hogarth's prints, of the engravings of Bartolozzi, and of engravings after the pictures of Sir Joshua Reynolds. There is also a tolerably extensive collection of portraits; but perhaps more remains to be done in this section than in any other, particularly as regards British portraits. One of the greatest curiosities in the collection of prints is an illustrated copy, in fourteen very large folio volumes, of Pennant's History of London. This is the bequest of a private gentleman, Mr Crowle, who spent the greater part of his life in preparing the volumes, collecting together, at a total expense of about £7000, an almost countless number of prints and drawings illustrative of Pennant's text, or of points connected with it.

The museum is particularly rich in what are called *Nielli*—that is, in silver plates inlaid with a black composition of silver and lead called Niello. This was a favourite kind of engraving with the Italian artists of the fifteenth century, *nielli* being much used as ornaments to articles of furniture, books, relic-chests, &c. It was the practice of workers in niello to prove their works as they proceeded by taking sulphur casts of the design on the silver, filling up the hollows in the casts with black, so as to judge what could be the effect if the silver were similarly inlaid. These sulphur casts from early nielli are not only very beautiful in themselves, but are valuable from their extreme rarity, and from the fact of their having led, as is supposed, to the practice of taking impressions of plate engravings on paper. That this invention was considerably posterior to that of wood-printing, is perfectly well ascertained—the earliest plate engravings known bearing date 1461, while there is a print from wood as old as 1423. Moreover, as the inventor of plate engraving, Thomas Finnequerra, a Florentine goldsmith, was a celebrated niellist, it is not unnatural to believe that he may have first caught the idea from his sulphur casts. He must have caught the idea slowly, however, for while his first plate engravings were not published till 1461, sulphur casts are in existence taken by him from nielli on which he was engaged at an earlier period. One such sulphur cast, taken from a pax of the assumption of the Virgin worked by him in 1452, is in the Print Room of the museum; it was purchased in 1835 for 270 guineas. Other works of art well worth seeing by the visitor to the Print Room are a beautiful silver cup, designed and carved by Benvenuto Cellini, and a wonderful stone carving in alto-relievo, by Albert Dürer, representing the birth of St John. For this last relic, Mr Knight, who bequeathed it to the museum, gave £500.

COIN AND MEDAL ROOM.

The first method of exchange among all nations was that of barter, a quantity of one commodity being given for such a quantity of another as was supposed equal to it in value. In each nation this practice would continue until the increasing extent of its commerce suggested the convenience of adopting certain special commodities as a medium of exchange, by reference to which the value of all other commodities could be measured. Sea-side shells, rock-salt, stones, even the eggs of fowls, have been occasionally used for this purpose by barbarous nations; but the substances selected almost by universal consent as a standard of value, have been certain of the more durable metals, particularly gold, silver, and copper, or alloys of these metals. At first these metals were used for money in the form of mere masses, lumps, or ingots, the value of which was ascertained by weighing them. An improvement upon this was to make up the metal or metals in use in ingots of a particular shape, the government of the locality where such ingots were current affixing a mark or stamp to each as a certificate that it was of the just weight. This particular primitive ingot usually became the unit of value in all the commercial transactions of the nation, and continued such even after its own weight and value had undergone a change. For a while, it alone would be current as money, but ultimately it would become convenient to have fractions or multiples of it, the higher multiples being made of the more precious metals, in order to be more portable. These also would be marked or stamped in the same way as the original ingot. Finally, the ingot form would be totally done away; pieces of the baser metals, such as bronze, cut of different sizes, but all portable, would be used for the lower values; and for the higher, similar pieces of silver and gold. Thus in each country or state a special currency would be established consisting of smaller and larger pieces of gold, silver, and bronze, bearing a known but varying relation to each other. These pieces of metal would also be stamped, as the primitive ingot had been; and such stamped pieces were coin. The word coin is derived by some from the Greek term *koinos*, which means common; and by others from the Latin *cuneus*, a wedge or ingot.

Such must necessarily have been the origin of coinage among all nations. It is curious, however, to think for how long a period the world continued to transact all its necessary business without having recourse to coined money. The ancient Egyptians had no coin; there is no allusion throughout the Old Testament to coin as having been used by the Hebrews; nor in all the poems of Homer do we find any allusion proving its use among the early Greeks. For at least three thousand years, according to the ordinary chronology, the inhabitants of our globe lived, tilled the ground, span and wove, bought and sold, as busily as now, without using a piece of coined money, and probably without using the metals at all as money to any great extent. As far as can now be ascertained, the spot on the earth where coined money first made its appearance was the small island of Ægina, on the coast of Attica, already referred to in a previous part of this volume (Phigalian Saloon) as having been at a very early period a bustling seat of Greek commerce, and a noted school of Greek art. It was about the year B.C. 895 that the Æginetans set up a mint; their first coinage consisted of pieces of metal stamped with the figure of a turtle. If any such Æginetan coins reached the pocket of Homer, he probably did not think them worth notice. Other Greek cities and states, however, followed the example of the Æginetans, each adopting, instead of the turtle of the Æginetans, some device or symbol connected with its own position, name, appearance, or legendary history. Thus the Selinuntines stamped on their coins the figure of a leaf of parsley, the name of their city, *Selinus*, also signifying parsley; the people of Clezomene adopted the device of a winged boar, an animal of this kind having once, according to a legend, ravaged their neighbourhood; and so on. At a later period, inscriptions or monograms, consisting of several letters, were added to the device, as *The.* for Thebes, *Sura.* for Syracuse, and such-like. Finally, by the extension of commerce, the coinages of different states were brought into some kind of correspondence, and a general Greek currency was established, consisting of coins of such denominations as the following:—BRASS.—The *Lepton*, an exceedingly small coin; the *Chalcos*, equal to about seven lepta; the *Dichalcos*, equal to two chalci; the *Hemiobolion*, or half obolos, equal to two dichalci; the *Obolos;* the *Diobolos*, or double obolos; the *Tetrobolon*, or double diobolon.—SILVER.—The *Drachmé*, equal to six oboli; the *Didrachmon*, equal to two drachmæ; the *Tetradrachmon*, equal to four drachmæ; the *Pentadrachmon*, equal to five drachmæ.—GOLD.—Various kinds of coins called *Staters*, varying in value from twenty-five to fifty drachmæ. Such at least is the list in its supposed complete state; at first, fewer coins would suffice; it was not, for example, till after the Peloponnesian war that the Athenians had any gold coins.

By a precisely similar process the Roman currency arose. The earliest Roman coins were of bronze, and were made in the reign of Servius Tullius. Among the coins ultimately adopted were the following:—BRASS.—The *Uncia*, a very small coin; the *Sextans*, equal to two unciæ; the *Quadrans*, or *Teruncius*, equal to three unciæ; the *Triens*, equal to four unciæ; the *Quincunx*, equal to five unciæ; the *Semis*, equal to six unciæ; the *As* (originally a pound in weight, but eventually reduced to two ounces), equal to twelve unciæ.—SILVER.—The *Sestertius*, equal to two and a-half ases; the *Quinarius*, equal to two sestertii; and the *Denarius*, equal to two quinarii.—GOLD.—The *Aureus*, or *Denarius Aureus*, equal to twenty-five silver denarii, or one hundred sestertii: fractions of the aureus were also used. Gold coin was not struck in Rome till the year B.C. 207.

As among the Greeks and Romans, so among the other civilised nations of antiquity the use of coin was gradually introduced. The Lydians appear to have had coined money at a very early period, probably almost as early as the Æginetans; and small gold coins called Darics, after the name of the king (Darius I.) who struck them, were current among the Persians as early as B.C. 490. Other eastern nations, including the Indians and the Chinese, may also have invented a metallic currency for themselves at a period of very remote antiquity. To the majority of the ancient nations, however, coined money must have been unknown till it was introduced among them by the Greeks and Romans. These two conquering races not only spread their own currency among the nations with which they came in contact, but induced those nations, by their example, to strike coins of their own with native denominations. Thus, among the Phœnicians, the greatest trading nation of antiquity, there were no coins till after the invasion of the East by Alexander the Great. The Carthaginians borrowed their coinage from the Greeks: the Hebrews were even later than the Phœnicians, and had no native currency till the time of the Maccabees; and in Spain, abounding as it did with gold and silver, coin was unknown till the Phœnicians and Greeks brought it with them. Under the Roman dominion a variety of new coinages sprang up in different parts of the empire—a Spanish coinage, a Gallic coinage, a Brittanic coinage, &c. &c.; all coexisting with the previous Greek and Oriental currencies, and with the standard issue of the imperial Roman mint. And out of this chaos of coinages subsisting under the Roman empire, arose the different early currencies of the modern European nations, to trace the alterations and modifications of which down to the present time would require a volume.

The first coins used by the Greeks and by other nations were mere pieces of metal rudely stamped with a device on one side. This was effected by laying the piece of metal (which, from the thickness and globosity of the early coins, seems to have been made up first in the shape of a bullet) upon a fixed bar or puncheon, and then striking the die or stamp down upon its upper surface with repeated blows of a hammer. Coins thus made would exhibit, in addition to the device or stamp on the upper side, a kind of indentation or cleft on the under side, caused by the violent percussion against the fixed puncheon. Among the improvements that would be gradually introduced would be these: the impression of a device on the under as well as on the upper side of the coin—effected by substituting a second die for the fixed puncheon on which the coin rested; the addition of an inscription on one or both sides of the coin; the rounding of the edge, and the approximation of the inscription to it, so as to prevent clipping, &c. In process of time, too, the design and execution of the dies employed would be greatly improved, until the coins that issued from them, from being mere clumsy pieces of metal with rude marks on them, became finished specimens of art. Different nations differed much in the style and finish of their coins; nor was the comparative rudeness or beauty of a nation's coinage always a sure indication of the degree of civilisation attained by that nation, for the Athenian coins are by no means among the finest known.

The ancient practice of striking coins with the hammer continued in use, with scarcely any variation, till so late as the middle of the sixteenth century, when the power of the screw was first applied to the coinage of money in the French mint. In England the new machine did not totally supersede the hammer till 1662. 'From that time to the present,' says a writer on the subject, 'only very trivial improvements have been introduced, and the machine continues to be worked. It consists of a screw, with which the upper die is connected; this is worked by a fly, and forces that die which is attached to it, with considerable force, upon the other die which is firmly fixed below. The advantage of this machine (known by the name of the mill and screw) over the old mode of striking with a hammer, consists chiefly in the increase of force, which is so great, as to raise the impression at one blow. The edges of the hammered money were left in a rude and unfinished state, which rendered them peculiarly liable to be diminished by clipping. After the mill was introduced, the coins began to assume a form nearly circular, which admitted of some addition to the impression, for the purpose of preserving the outward edge. This was first attempted (in the reign of Elizabeth) by placing a graining so as to form a regular circle on the outside of the legend or inscription, quite to the edge of the coin. Afterwards (1651), a legend was imprinted on the edge of the larger pieces. As it is scarcely practicable to impress a legend upon the rim of the smaller coins, a graining has been devised for the protection of their outer edge. This, which is known by the technical term melling, was first used in 1663.' By such mechanical improvements the coins of modern times have been made much neater in appearance than those used by the ancients.

The science of *numismatics*, as it is called, or that branch of archæology which treats of coins and medals, ascertaining their dates, classifying them, &c. has naturally become the subject of much ridicule to such persons as have witnessed the zeal of coin-collectors, without considering what might be its fruits. 'These gentlemen,' says one of the speakers in Addison's dialogues upon the usefulness of ancient medals, 'value themselves upon being critics in rust, and will undertake to tell you the different ages of it by its colour. They are possessed with a kind of learned avarice, and are for getting together hoards of such money only as was current among the Greeks and Latins. There are several of them that are better acquainted with the faces of the Antonines than of the Stuarts, and would rather choose to count out a sum in sesterces than in pounds sterling. I have heard of one in Italy that used to swear by the head of Otho. Nothing can be pleasanter than to see a circle of these virtuosos about a cabinet of medals, descanting upon the value, rarity, and authenticalness of the several pieces that lie before them. One takes up a coin of gold, and having well weighed the figures and inscription, tells you very gravely if it were brass it would be invaluable. Another falls a-ringing a Piscennius Niger, and judiciously distinguishes the sound to be modern. A third desires you to observe a toga on such a reverse, and asks you whether you can in conscience believe the sleeve of it to be of the true Roman cut.' Such impressions as these disappear after a little reflection. Various solid arguments may be urged in favour of the study of numismatics. In the first place, coins are in themselves works of art, the inspection of which is at least a source of legitimate pleasure; again, coins and medals are of great service to history. They serve in many cases to determine the chronology of events; they even preserve the memory of events of which there is no other record; they make us acquainted with the portraits of eminent personages of bygone times, and thus, besides gratifying a natural curiosity, help us the better to understand the affairs in which these personages took part. They also cast light upon numberless points of antiquarian interest; some coins, for example, bearing images of celebrated ancient edifices that have long since disappeared; others containing illustrations of curious ancient ceremonies or customs. By an extension of this use of coins and medals, they may be turned to account in the interpretation and illustration of the ancient poets—a topic on which Addison has specially dilated in the above-mentioned paper. Lastly, in a cabinet of coins and medals, we have the materials for ascertaining the various modifications which the different alphabets and systems of written character in use among different nations have undergone, from a period as early as B.C. 700 to the present time.

The collection of coins and medals in the British Museum is superior to any existing, except perhaps that at Paris, which in some respects has the advantage. The other great collections are those of Vienna and Florence. The collection in the British Museum is the aggregate of many purchases, bequests, and donations. The cabinets of Sir Hans Sloane and Sir Robert Cotton, which were the foundation of the whole, were in themselves considerable. About six thousand ancient medals were added in 1772—part of the Hamilton collection of antiquities. In 1799, a splendid collection, valued at L.6000, was bequeathed to the museum by the Rev. Clayton Mordaunt Cracherode. In 1802 the trustees gave L.620 for a series of Anglo-Saxon coins that had belonged to Samuel Tyssen, Esq. In 1810 a collection of English coins from the Conquest to the reign of George III. was bought for 4000 guineas; and at the same time were bought a series of papal medals for L.135, and a cabinet of Greek coins for L.800. Next came the Townley collection of Greek and Roman coins; a private cabinet of Greek coins bought for L.630; and a small collection attached to the Elgin marbles. In 1818 Lady Banks presented to the museum a large collection of coins, part of the splendid cabinet of Mrs S. S. Banks. In 1824 Mr Payne Knight bequeathed his fine collection to the museum. In 1825 a collection of Arabian, Parthian, and Jassanian coins that had belonged to Mr Rich, was purchased for the museum; and in the same year King George IV. presented to the museum the extensive cabinet of English and foreign coins and medals that had been attached to the library of George III. Subsequent additions, among which the most considerable was a magnificent assemblage of Oriental coins presented in 1834 by William Marsden, Esq. have raised the collection to its present pre-eminence.

The Coin and Medal Room is included in the general department of antiquities, and is adjacent to the Ethnographical Room. The coins and medals are kept in wooden cases or cabinets ranged round the room; each cabinet opening with folding-doors, and containing a number of little drawers or trays in which the medals lie. The whole collection is comprehended under these three divisions:—1. Ancient Coins; 2. Modern Coins; and 3. Medals.

Ancient Coins.—The system of arrangement followed with regard to the ancient coins is substantially that proposed by the celebrated German numismatical writer, Joseph Eckhel, in his great work on ancient coins, published at Vienna in 1792. According to this arrangement, all ancient coins are divided into—1, Greek, and 2, Roman.

Under the head of Greek coins are included 'all those struck with Greek characters, in Greece or elsewhere, by kings, states, or cities, that were independent of the Romans; together with the coins of free states and cities that made use of the Etruscan, Roman, Punic, Spanish, or other characters'—in other words, all the coins struck anywhere in the world, whether by Greeks or barbarians, prior to the rise of the Roman power, together with all the coins issued by ancient states, Greek or barbarian, so long as they remained unsubjugated by that power. To bring something like order into this vast assemblage of coins, the chronological range of which is from B. C. 700 to about A. D. 300, or even later, they are subdivided into autonomous and imperial; the autonomous including all that were issued by separate states or cities, the imperial all that were issued under the authority of any of the general sovereigns of the Greek world—that is, of any of the successors of Alexander the Great. Both are arranged in geographical order, according to the countries in which they were issued; commencing with Spain, and proceeding eastward round the northern coast of the Mediterranean, so as to include every country and state that issued coins, as far north as Britain and Germany, and as far east as Persia and Bactriana, and then returning westward to Egypt and the countries forming the southern or African fringe of the Mediterranean. Under each state or country, the coins are farther classified according to the city or town in which they were struck. To facilitate these minute arrangements, a numismatic atlas of the ancient world has been prepared, and is published as an appendage to the voluminous work of the French numismatic author Mionnet.

The Roman coins are arranged, as far as practicable, in chronological order, from the early consulates, to the fall of the western empire. 'They consist,' says Mr Hawkins, 'of the as and its divisions; family or consular coins; imperial coins struck in Rome; imperial coins struck in Egypt; imperial coins struck with Greek characters in different states and cities subject to the Romans; imperial coins struck in the Roman colonies; imperial coins struck with Punic characters; and contorniates'—which last are supposed to have been tickets of admission to places of amusement. Of all the Roman coins, the imperial series, as might be supposed, is the most complete and interesting. Those of copper being of different sizes, are distinguished into three kinds—the first, second, and third brass; the first or largest being the most valuable.

Modern Coins.—Under this head are comprehended all coins struck since the fall of the western empire—namely, 'Anglo-Saxon, English, Anglo-Gallic, Scotch, and Irish coins, and the coins of foreign nations. They are arranged according to the respective countries to which the coins belong, those of each country being kept separate.' The Italian series commences about A. D. 480; the French series with Clovis, A. D. 490; the Spanish series about A. D. 567. The German states seem to have struck money shortly after the time of Charlemagne. The first papal coins are those of Pope Hadrian I., A. D. 772. The earliest coin struck in these islands, whose date can be fixed, is a *sceatta* (small coin) of Ethilbert I., Saxon king of Kent, who reigned A. D. 561–616. From that period the series of Anglo-Saxon and English coins is complete. A branch of the general English coinage is that called Anglo-Gallic, including all coins struck in France by English princes, beginning with Henry II. The first Irish coins are those of the petty Irish kings of the eleventh century; the first Scottish are the pennies of Alexander I., A. D. 1107. Of the northern nations, the Swedes first had a coinage (A. D. 818); then the Danes; and lastly the Norwegians (A. D. 1066). Of all the European coinages, the latest is the Russian. The modern Oriental coins include, *first*, all belonging to the empire of the caliphs, as well as those of the various Mohammedan dynasties, whether Asiatic, African, or European, that arose out of the ruins of that empire, some of them still existing; and *secondly*, the coins of eastern Asia—namely, the Persian, the

Indian, the Chinese, the Indo-Chinese, the Japanese, &c. In this department of coins the museum is particularly rich, Mr Marsden's collection having been increased by subsequent additions.

Medals.—This name is applied to such productions of the mint as are intended to commemorate events, or to do honour to individuals, without being intended to pass for money. The Greeks hardly appear to have practised this species of metallic workmanship; but under the Roman emperors medals and medallions—that is, medals of large size—were not uncommon. High prices are now given for medals struck between the time of Julius Cæsar and Hadrian. It cannot, however, be decisively asserted that such medals were not allowed to pass current as money; hence a distinction between them and the modern productions, specially comprised in the museum collection under the name of medals. Another distinction between ancient and modern medals is, that in the latter alone have we representations of eminent private men. 'It is remarkable,' says a writer on this subject, 'that while busts are found of many celebrated poets, historians, and philosophers of antiquity, their portraits never occur on medals.' It was not till after the revival of the arts in modern Europe that medals were employed for the purpose of transmitting to posterity the portraits of men famous for literary or scientific achievements. The earliest-known modern medal is one of David II., king of Scotland, probably struck during his captivity in England A. D. 1330–1370. With this exception, the series of European medals does not commence earlier than the fifteenth century. In Italy the earliest medal (if we except one of John Huss, of doubtful authenticity, dated 1415) was one struck by the Council of Florence in 1439; the celebrated series of papal medals begins with Paul II., who assumed the pontificate A. D. 1464. The first German medal was struck in 1453; the first Sicilian in 1501; the first Spanish in 1503; the first Venetian in 1509; the first Danish in 1516; the first Dutch in 1566. Among the German and Dutch medals are many of a satirical character. The French medals of a date earlier than the reign of Louis XIV. are of inferior execution; but the medals of this monarch, and those struck in memory of the chief events of the life of Napoleon, are extremely good. The first English medal bears date 1480, and was struck, probably by an Italian artist, for a private English nobleman: the series of regal medals commences with one struck by Henry VIII. The first English coronation medal was that of Edward VI.; the first British medal with a legend round the edge was a Scotch coronation medal of Charles I. Besides an almost perfect series of British medals, the museum collection possesses a fine series of the papal, and a still finer series of the Napoleonic, medals. The arrangement of the medals is on the same plan as that of the modern coins.*

THE MANUSCRIPT ROOM.

One large hall on the ground-floor, attached to the library, and looking like a part of it, contains the entire collection of manuscripts belonging to the museum. The manuscripts are for the most part bound in the form of volumes, and deposited in cases round the room; some of the more curious documents, however, among which is the original Magna Charta, are placed in table-cases, so as to be more easily seen by the occasional visitors that stroll through this part of the museum.

To furnish some idea of the extent and value of the collection of manuscripts deposited in this room, it will be sufficient to indicate briefly the nature of the several collections of which, as was explained in the historical notice at the beginning of the volume, it is the aggregate:—1. *The Sloanean Manuscripts.*—This collection consists chiefly of manuscripts on natural history and medicine; but contains also numerous manuscripts on other subjects. It comprises also a number of drawings of animals; among which are two volumes of drawings on vellum from the pencil of the celebrated Madame Merian (born 1647—died 1717), acquired by Sir Hans Sloane at a large price. Among the manuscripts are the chief of those of Kœmpfer, the distinguished traveller and botanist (born 1651—died 1716); and a voluminous collection of medical manuscripts that belonged to Sir Theodore Mayerne, who was physician at the English court from 1611 to 1649. 2. *The Cottonian Manuscripts.*—'This collection,' says Sir Henry Ellis, 'is especially rich in historical documents from the time of the Saxons to King James I.; it likewise contains numerous fine and important registers of English monasteries: the charters of King Edgar and King Henry I. to Hyde Abbey, near Winchester, written in golden letters; and the manuscript called "the Durham Book"—a copy of the Latin gospels, with an interlineary Saxon gloss, written about the year 800, illuminated in the most splendid style of the Anglo-Saxons, and believed once to have belonged to the venerable Bede. This collection is also singularly rich in royal and other original letters, and comprises the correspondence of most of the greatest personages not only of this country, but throughout Europe, from the earliest period in which letters were written to the seventeenth century.' 3. *The Harleian Manuscripts.*—This collection is somewhat similar in its nature to the Cottonian collection, but perhaps more miscellaneous. It comprises ancient records, civil and ecclesiastical; abbey registers; heraldic and genealogical manuscripts; and topographical accounts of almost all parts of England, besides a mass of ancient correspondence. It is also rich in illuminated missals, &c.; in manuscripts of the classics, among which is one of the earliest-known manuscripts of the Odyssey of Homer; and in early English poetry. 4. *The Manuscripts of the Ancient Royal Library*, added to the museum in 1757. —'This collection,' says Sir Henry Ellis, 'contains whatever had been brought together by our kings from King Richard II. to King George II. Many of the manuscripts came into the royal possession at the time when our monastic institutions were destroyed; and some still retain the anathemas upon their spare leaves which the donors denounced against those who should alienate the respective volumes from the places of their original deposit. Old scholastic divinity abounds in this collection; and it possesses innumerable volumes enriched by the finest illuminations of different countries in a succession of periods to the sixteenth century.' Among the individual manuscripts are the Basilicon Doron of King James I., in his own handwriting; and the celebrated Codex Alexandrinus—a vellum manuscript in four quarto volumes of the Greek Bible, written probably between A.D. 300 and A.D. 500, and presumed, therefore, to be the most ancient manuscript of the Greek Bible now extant. It was presented to King Charles I. by Cyril, patriarch of Constantinople. A published fac-simile of this valuable manuscript, in three volumes folio, is sold for £18. 5. *The Lansdowne Manuscripts.*—This collection comprises the Burghley and Cæsar papers; the manuscripts of Bishop Kennett, and numerous valuable historical documents; besides about 200 Chinese drawings. Among the individual manuscripts are one of Hardyng's Chronicle, presented by the author to King Henry VI.; a copy of the very rare French manuscript version of the Bible, executed by Raoul de Presle for Charles V. of France; and five volumes of old Saxon homilies. 6. *The Hargrave Manuscripts.*—These manuscripts, collected by Francis Hargrave, Esq., and purchased from his executors in 1813, are almost exclusively connected with law. Among them are numerous copies of ancient law-reports. 7. *The Burney Manuscripts.*—This collection, made by the Rev. Dr Charles Burney, and purchased in 1818, consists chiefly of manuscripts of the Greek and Latin classics. It comprises an ancient manuscript of the

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* See Pinkerton's 'Essay on Medals;' Addison's 'Dialogue on the Usefulness of Ancient Medals;' or, for less elementary purposes, Eckhel's 'Doctrina Numorum Veterum,' 8 vols. quarto, Vienna, 1792; Mionnet's 'Description de Medailles Antiques Grecques et Romaines,' 15 vols. Paris, 1806–37; also the general catalogues of the museum coins by Mr Taylor Combe and Payne Knight; the catalogues of the Anglo-Gallic coins and the English silver coins by Mr Hawkins; and Mr Marsden's catalogue of Oriental coins.

Iliad, matching with that of the Odyssey in the Harleian collection, and bought for 600 guineas; and a splendid illustrated copy of Ptolemy's geography, made in the fifteenth century. 8. *The Howard-Arundel Manuscripts.*—This collection, 'acquired partly by exchange, and partly by purchase, from the Royal Society in 1831, at an estimated value of £3559, consists,' says Sir Henry Ellis, 'of more than 500 volumes, and contains many manuscripts of unusual interest in almost every branch of learning. It is singularly rich in materials for the history of our own country and language.' 9. *Oriental Manuscripts.*—This collection is composed of several purchases and bequests; it includes the valuable collection made by Mr Rich while consul at Bagdad, and consists of numerous Syriac, Arabic, Ethiopic, and other Oriental codices. 10. *Miscellaneous Manuscripts.*—These consist of innumerable bequests, donations, and purchases, gradually added to the general collection from the establishment of the museum to the present time.

To facilitate the use of so vast an accumulation of manuscripts, catalogues have been prepared of the several collections included in it. Of the *Royal Manuscripts* there is a catalogue in quarto, published in 1734, the work of David Casley, then king's librarian; of the *Cottonian Manuscripts*, a folio catalogue, by Joseph Planta, Esq., was published in 1802; a catalogue of the *Harleian Manuscripts*, in four volumes folio, the joint work of H. Wanley and the Rev. R. Nares, was published in 1808; of the *Hargrave Manuscripts* there is a catalogue in quarto by Sir Henry Ellis, published in 1818; of the *Lansdowne Munuscripts*, a folio catalogue, prepared by Sir Henry Ellis and F. Douce, Esq., was published in 1819; of the *Arundel Manuscripts*, a catalogue in one volume folio, by the Rev. J. Forshall, was published in 1834; and of the *Oriental Manuscripts*, a catalogue has recently (1838–1847) been published in three parts, folio, the first comprehending the Syriac, the second the Arabic, and the third the Ethiopic manuscripts. Separate catalogues have also been published of the manuscript music in the museum, and of the charts and drawings it contains. Of the *Miscellaneous Manuscripts* in the collection, a catalogue, in two volumes quarto, by the Rev. S. Ayscough, was published in 1782, including such manuscripts as had been acquired up to that period. There is also a catalogue of additional manuscripts.

THE LIBRARY OF PRINTED BOOKS.

The library of the British Museum takes rank with the libraries of Vienna, Berlin, and Dresden, and is inferior only to those of Munich and Paris. The total number of volumes contained in it is 435,000, of which no fewer than 135,000 have been added within the last four years. This vast collection of printed books occupies some twelve or thirteen apartments, some of very spacious dimensions, on the ground-floor of the building, besides various cellars beneath, specially devoted to the reception of newspapers and pamphlets.

The entire library may be said properly to consist of two parts—the king's library—that is, the library formed by George III. during his long reign, at an expense of £200,000, and made over to the nation by George IV. in 1823; and the general collection of books possessed by the museum before the date of that acquisition, or accumulated since.

The king's library, which, by the terms of the donation, is ever to be kept apart from the rest of the collection, occupies a separate hall—perhaps the largest and most handsome of all the apartments in the museum. The library is undoubtedly the finest and most complete ever formed by a single individual. 'It contains,' says Sir Henry Ellis, 'selections of the rarest kind, more especially of works of the first ages of the art of printing; it is rich in early editions of the classics, in books from the press of Caxton, in the history of the states of Europe in the languages of the respective countries, in the transactions of academies, and in a grand geographical collection.' As no addition can be made to this library, it stands precisely as it was left by George III., a creditable monument of that old monarch's homely regard for literature. There is a separate catalogue of this portion of the general museum library, privately printed by royal authority, in several large folio volumes. A special catalogue of its geographical and topographical works has also been printed in one volume folio, or two volumes octavo.

The general collection of books, independent of the king's library, is the aggregate of all the purchases, bequests, and donations of books from the original bequest of Sir Hans Sloane to the acquisition, the other year, of the valuable collection known as the Grenville Library. As regards current British literature, the interests of the library are secured by the important claim on Stationers' Hall, acquired with the old royal library in 1757. An annual sum of £2000 or thereby is expended by the trustees in the purchase of old and foreign books; and these ordinary means of increase, assisted, as has been the case of late, by extraordinary grants from parliament, will probably soon enable the library of the British Museum (the king's library being considered as part of it) to rank as the first library in the world.

Of the general collection of printed books (apart from the king's library), an alphabetical catalogue, in seven octavo volumes, by Sir Henry Ellis and the Rev. U. H. Baber, was published in 1813–1819. So great have been the additions to the collection since the publication of that catalogue, that the interleaved copy of it in which the new entries have been made in manuscript by the officers of the museum, has expanded into sixty-seven folio volumes. To supersede this obsolete catalogue, and also the private catalogue of the king's library, which is not accessible to the public, a completely new catalogue of the whole collection of books in the museum has for some time been in progress, under the superintendence of Mr Panizzi, at present chief of the printed book department. The work has advanced, however, at a provokingly slow rate; letter A, in one volume folio, is all that has yet been published; and as those employed in the work of cataloguing have not yet reached the middle of the alphabet, many years must elapse ere the whole shall be complete.

THE READING-ROOM.

Two of the largest apartments of the library of printed books have been specially fitted up as a reading-room for the use of the public. In these apartments, which are accessible by a private entrance at the back of the museum, a number of persons of both sexes are daily engaged—from ten to four in winter, and from ten to seven in summer—in reading, consulting books, copying manuscripts, making extracts, &c. &c. Ink and pens are provided; on the writing-desks are book-holders, paper-cutters, &c.; the chairs are comfortably stuffed; and all that the reader is required to bring with him or with her is his or her own manuscript book. Seated in this room, the reader has at his command the whole collection of printed books or manuscripts belonging to the museum. He has but to write the name of the work or manuscript wanted, with the marks attached to it in the catalogue, upon a printed ticket, appending also his own signature, and the day of the month; and in a few minutes after he has presented this ticket to the proper attendant, the book or the manuscript will be brought to him. There is no limit either as to the number of works he may order. Some readers may be seen with piles of volumes beside them, occupying half the table at which they sit; others with but a single volume, which they hold in their hands. Each book or manuscript, however, must be written for on a separate ticket. Sometimes, when the book or manuscript wanted is particularly valuable, it is not brought to the reading-room, but the person who wishes to consult it is taken, for greater security, to the room where it is deposited. The reader may copy as many extracts as he chooses from any book or manuscript, but no entire manuscript can be copied without the special permission of the trustees. Before the reader leaves the Reading-Room, he must return all the books or manuscripts to an attendant, receiving back the corresponding tickets; every reader being considered responsible for every book or manuscript he has ordered so long as the ticket remains uncancelled. Under no circumstances is a reader permitted to take any book or manuscript out of the Reading-Room. A proposal has indeed been made, that in cases where there are duplicates of any work in the museum, readers should be allowed, under certain conditions, to take one of the copies home with them as from a circulating library; but there is as yet no law of the museum to that effect.

From this brief account of the Reading-Room of the British Museum, it will be seen of what vast advantage it is to the literary public. There is not a person in London engaged in literature, probably not a person professedly so engaged throughout the whole kingdom, that has not, or may not have, occasion to pay a visit to this wonderful place. Here occasionally may be seen our authors and authoresses of greatest note glancing over rare books, making brief extracts, and hastening to be off; and here, more habitual and regular visitors, may be distinguished the young student reading professionally, the humble copyist driving his pen mechanically over the paper, and so earning his scanty and laborious livelihood; or, lastly, the conscientious writer of history, deep in the business of research. There are, indeed, some drawbacks on the ideal perfection of this metropolitan institution (for so it may deservedly be named) for the benefit of the national literature. In the first place, however admirable the order that is kept in it, one cannot proceed with his work so satisfactorily in so crowded a room as in the quiet of his own study. One reader by you annoys you with his 'bassoon nose;' another with his whisperings to himself; a third with his clanking heels; a fourth with his wo-worn look. Some persons, too nervously sensitive to such impressions, have never been able to sit an hour in the Reading-Room with comfort. Again, it is not unfrequent, when one orders a book, to find that it is 'on hand,' or 'at the binder's.' But the greatest subject of complaint among readers is the present imperfect state of the catalogue, in consequence of which it is often very difficult to find a book, even when it is in the library. The Grenville Library, for example, is not yet accessible to the public through any synopsis of its contents; and all new books, without exception, have to lie on the shelves for several years before they are allowed to be entered in the Reading-Room catalogue as open for perusal. This last regulation is decidedly the one that ought first to be abrogated. That the Reading-Room of the British Museum ought not to be made a place where people might go to read the new novels and periodicals as they came out, is certainly true; but that, as at present, an important book should not be accessible to a reader till it is a year or two old, is scandalous. The argument, that such a restriction is necessary, as a protection to the right of publishers, who would otherwise sell fewer copies of a new book, is absurd, and will not bear a moment's consideration.

The means of obtaining admission to the Reading-Room are sufficiently easy. The person who desires admission procures a note of introduction from any well-known individual—a merchant, a member of parliament, or such-like; this he forwards through the post to the chief librarian of the museum; who in return, if the recommendation is satisfactory to him, sends the applicant the necessary ticket. This ticket admits the holder for six months, and is renewable without farther trouble. The entire number of persons now on the library books, as entitled to the privilege of admission to the Reading-Room, is between 30,000 and 40,000; the average attendance per diem is 250.

APPENDIX B.

SINCE the foregoing pages were written, a few alterations have taken place in the arrangements of the museum. The following indications will serve to make the visitor aware of the nature and extent of these changes :—

ETHNOGRAPHICAL DEPARTMENT.—Here the changes consist almost entirely in the addition of a few miscellaneous objects to the *Ethnographical Room.* Among these are a model of part of Blackfriars' Bridge (on the floor); an Indian cabinet of ebony inlaid with ivory (side of Cases 12 and 13); the magic drum of an Iceland witch (Shelf III, Cases 18–19); a Mexican sacrificial basin, said to have been the sacrificial vase of the Temple of the Sun at Cuzco (Cases 36–37); a fishing-basket and a girl's sampler from the Navigators' Islands (Cases 66–67); and the prow of the canoe of the celebrated New Zealand chief Heki (above Cases 68–69). A few objects have also been added to the *Egyptian Room*, the *Bronze Room*, and the *Etruscan Room.*

NATURAL HISTORY DEPARTMENT.—In this department some additions not affecting the order of arrangement have been made in the *Mineralogical*, the *Botanical*, and the *Palæontological* or *Fossil* Sections. In Room VI of the Fossil Section, for example (which is now in a somewhat more orderly condition than it was a little while ago), there is to be seen a very interesting object— 'the cast of the skeleton of the megatherium; a genus of edentata established by Cuvier from the only species known—the *Megatherium Americanum* of Blumenbach (*Megatherium Cuvieri* of later writers). The bones from which the casts of the several parts are taken are preserved partly in the museum of the Royal College of Surgeons, and partly in Cases near the skeleton.' But the chief alterations in this department, and indeed the only alterations in the museum that affect the arrangement or ordering of the Cases as described in the preceding account, have occurred in the *Zoological Section.* Even here, however, the changes are almost entirely confined to one of the apartments—that known as the Northern Zoological Gallery. This apartment, which was previously in a very confused state, being used as a kind of receptacle for superfluous radiata, articulata, mollusca, and vertebrata indiscriminately, has been refitted, and put into something like order; and though it still retains too much of the appearance of a stow-room for whatever could not be accommodated elsewhere, it is decidedly more pleasant to visit than it used to be. We shall describe the changes made here somewhat particularly:—

Room I.—Here the Table-Cases stand as before; but in the contents of the Wall-Cases there is a difference. The collection of skulls of large mammalia formerly occupying the Wall-Cases to the left has been removed; and in lieu of it there is the collection of bats, formerly to be found in Room III of the same gallery. These have been transferred thus:—The bats of Case 24 in Room III now occupy Wall-Cases 1–3 in Room I; those of Case 25 in Room III occupy Wall-Cases 3–4 in Room I; those of Case 26 in Room III occupy Wall-Case 5 in Room I; and those of Cases 26–29 in Room III occupy Wall-Cases 6–8 in Room I. Again, in the Wall-Cases on the right, we have, in addition to the collection of birds'-nests which formerly stood there, the curious collection of nests of insects transferred thither from the Wall-Cases of Room V in the same gallery.

Room II.—Here the old arrangement is still continued, except that the ordering of the Cases is somewhat altered. Thus 'the lizards,' which formerly occupied Wall-Cases 1–7, now extend through Wall-Cases 1–10; 'the serpents,' formerly spread through Wall-Cases 8–19, are now collected in Wall-Cases 11–17, the first of which is devoted to the poisonous serpents; the 'tortoises and turtles,' formerly contained in Wall-Cases 20–23, now fill Wall-Cases 18–23; the 'crocodiles and amphisbænas,' formerly included in the single Wall-Case 24, are now contained in Wall-Cases 24–26; and the 'batrachians,' formerly occupying Wall-Cases 25–26, now occupy the lower part of Wall-Case 26. In the Table-Cases there is no difference from the old arrangement.

Room III.—A very useful change has been made in the arrangements of this room. Instead of containing, as before, a miscellaneous collection of corals, glirine mammalia, and fish, the room has been converted into a kind of *Museum in Museo*, presenting at one view to the visitor a collection of the particular zoology of our own island. This is a highly creditable arrangement, and cannot fail to be instructive, seeing that whoever wishes to have before his eyes a complete collection of all the forms of animated existence known to exist in Great Britain, has only to go to this special room of the museum to have his wish reasonably gratified. The following is the distribution of the British animals through the room, as given in the authorised catalogue:—

I.—British Vertebrata, occupying the Wall-Cases as follows:—(1.) *British Mammalia*, distributed through Wall-Cases 1–9; thus: Case 1. British Bats in the upper part; Cases 1–5. British Carnivorous Beasts—as cats, foxes, martens, stoats, seals; Case 5. British Insectivorous Beasts in lower part—as shrewmice, moles, hedgehogs; Cases 5–6. British Glires—as rats, mice, squirrels, rabbits, hares; Cases 7–9. British Ungulated or Hoofed Beasts—as the stag, the roebuck, the fallow-deer. (2.) *British Birds*, distributed through Wall-Cases 10–30; thus: Cases 10–13. British Raptorial Birds—as eagles, hawks, owls, &c.; Cases 14-16. British Perching-Birds—as goatsuckers, swallows, rollers, kingfisher, bee-eater, warblers, wagtails, thrushes, fly-catchers, chatterers, and butcher-birds; Cases 17–18. British Gallinaceous Birds—as pigeons, peacock, pheasant, fowls, turkey, guinea-fowls, partridge, quails; Cases 19–22. British Wading-Birds—as the courser, the heron, the stork, sandpipers, snipes, woodcocks; Cases 23–30. British Webfooted Birds—as ducks, swans, sea-ducks, merganser, grebes, divers, auks, petrels, skua-gulls, gulls, terns, gannets, and cormorants. (3.) *British Reptiles*, occupying the upper part of Wall-Case 31—as lizards, snakes, toads, frogs, efts. (4.) *British Fishes*, distributed through Wall-Cases 31–43; thus: Case 31. Gurnards and perches; Case 32. Weavers, bullheads, and breams; Case 33. Mugils, John Dorys, and wolf-fish; Case 34. The angler and rockfish; Case 35. Carps and barbels; Case 36. Pikes and salmons; Case 37. Salmons and trout; Case 38. Cod, haddock, and ling; Case 39. Turbot, plaice, flounders, soles, the lumpfish, and the pipefish; Case 40. Sturgeon and sharks; Cases 41–43. Rays, thornbacks, and lampreys. II.—Eggs of British Birds. These are arranged in Table-Case 1 in the same order as the birds in the Wall-Cases. III.—British Invertebrata, as follows: (1.) *British Annulose Animals*, in Table-Cases 2–4: thus Case 2. British insects with jaws—as beetles, earwigs, cockroaches, crickets, grasshoppers, dragon-flies, caddis-flies, ichneumons, ants, bees, and wasps; Case 3. British insects with a proboscis—as bugs, butterflies, moths, two-winged flies, gnats, &c.; Case 4. British spiders, centipedes, and crustacea—as crabs, lobsters, shrimps, woodlice. (2.) *Shells of British Mollusca* in Table-Cases 5 and 6; namely, Gasteropods—such as snails; and Conchifers or Bivalves—such as oysters, mussels, cockles. (3.) *British Radiata*, Table-Case 8—namely, sea-urchins, starfish, corals, corallines, and seapens.

Room IV.—There is little change in the arrangement of this room, save that some of the fishes formerly occupying the Table-Cases have been shifted in position, especially in Table-Cases 17–26; and that all the cartilaginous fishes have been removed to next room.

Room V.—The Wall-Cases of this room, formerly devoted to molluscs, radiata, and crustacea, preserved in spirits, and to insects' nests, are now occupied by the collection of cartilaginous fishes removed from Room IV. The Table-Cases, as before, contain the sponges.

These changes in the Northern Zoological Gallery have occasioned a few trivial changes in the other zoological rooms. Thus to furnish forth the collection of British animals contained in the Northern Zoological Gallery, certain specimens have been removed thither that formerly stood in the Central Saloon, the Mammalia Saloon, and the Eastern Zoological Gallery; while these apartments, on the other hand (and especially the Mammalia Saloon, to which the corals have been removed), have received accessions from the Northern Zoological Gallery. There are also some new objects in the Central and Mammalia Saloons, as well as in the Eastern Gallery; but upon the whole the arrangements in these apartments remain very much as they were.

DEPARTMENT OF ANCIENT SCULPTURES.—Room I remains as it was, save that some of the Nimroud sculptures, formerly placed along the outer wall, have been removed, to make way for new arrivals, to the distinct apartment beneath fitted up specially for the reception of the Nimroud antiquities. The Lycian Room also remains as it was. The temporary passage has, however, now been abolished, in consequence of the progress of the new building, and the few antiquities that were deposited in it have been removed elsewhere. At the present moment, in consequence of repairs and decorations that are going on in the Grand Central Saloon, the noble collection of Greek and Roman sculptures appropriated to it, is temporarily withdrawn from public view, being packed up in boxes, or otherwise disposed of. A few months, however, will restore them to their usual places. The Egyptian sculptures remain as they were, as also do those of the Elgin and Phigalian Rooms, save that a few of the statues formerly placed in the Central Saloon are now temporarily in the Phigalian Room, and that the models of the Parthenon, which stood in the Phigalian Room, are now in their proper place in the Elgin Room.

THE LIBRARY AND READING-ROOM.—A few alterations have been made on this department, rendering it more convenient to the public. A new and enlarged catalogue, for example, has been placed in the Reading-Room for the use of readers, obviating for the present some of the complaints that have long been made against Mr Panizzi's delay in the preparation of the promised printed catalogue; the wire-screens have also been removed from the Cases in the Reading-Room; and to these Cases have been added many books in frequent demand for the purposes of consultation, but not there before. The absurd restriction against the use of *new* books is also in part removed.

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Edinburgh:
Printed by W. and R. Chambers.